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Combating Urban Sprawl: Proposing an Urban Containment System for the Austin Region

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Combating Urban Sprawl: Proposing an Urban Containment System for the Austin Region

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Abstract

Combating Urban Sprawl: Proposing an Urban Containment System for the Austin Region

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This professional report aims to gather lessons from multiple references in order to draw implications for the Austin region and strategies in adopting growth management. Specifically, Urban Containment Systems will be evaluated throughout different parts of the country through a dissection of regional comprehensive plans. In addition, strategies from different Council of Governments in regards to growth management will be discussed. Containment isn't regulated at the state or regional level. Although local approached in growth management have been implemented through ordinances and initiatives, it will be important to also acknowledge ways a bottom-up approach could be applied for the Austin region as a whole.

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CHAPTER 1: INTRODUCTION

The saying everything is Bigger in Texas is one that Texans pride themselves in. In fact, it appears that this saying fits in perfectly when regarding urban sprawl and how Texas's four largest metropolitan areas have succumbed to it. Urban sprawl is not something to take pride in as it is conducive to a multitude of including congestion, air pollution, loss of green space, racial disparities, and so forth. With so many adverse effects of urban sprawl, urban containment systems could be deemed as a possible solution.

Urban Containment Systems (UCS) are policies directed at managing growth and essentially have two purposes. The first deals with promoting compact growth and accessible development with efficient transportation services. The second deals with preserving open space and most notably those areas not suitable for urban development; in addition to open space preservation, there is also an adequate distribution for agricultural use. Some states such as Oregon have recognized the benefits of UCS and have regulated the policy statewide. Other states, such as Texas, lack the political will to enforce such a policy, and private gains are ultimately favored over public goods. Furthermore, Texas continues to fail in addressing the consequences derived from a rapidly growing population. To put these matters into context, relevant phenomena will be presented in regards to Texas and its ever-growing need for growth management. To start, four of the top five fastest growing cities in the entire United States are in the Texas Triangle, and to add, many of the areas in which new development has expanded have been seen to place environmental effects as a second or third priority. Such is the case in San Marcos, TX, a rapidly growing city that continues to see new homes sprawl towards the peripheries. In 2015 for the Houston Metropolitan area, over 64,000 permits were issued to build homes. Conversely, the entire state of California issued over 83,000 permits (Swanson, 2015). The Houston area, like Central Texas, has an ongoing

battle with flooding, and the fact that development continues to expands outwards means that this issue, among others that come from sprawl, will not be resolved anytime soon. Local ordinances and initiatives such as the Drinking Water Protection Zone help in growth management, but the fact that Texas has no state guidance or regional regulations on urban growth means that regional efforts will have to adopt a bottom up approach.

In the past, the Austin area has made efforts in containment through plans such as the Austin Tomorrow Comprehensive Plan in which alternative growth patterns were analyzed for growth management. Decades after, the Austin region developed Envision Central Texas (ECT) in that the goal was regional coordination in terms of planning decisions. Unfortunately, ECT was a non-profit that resulted in losing funding for support. Although successful at the regional scale, past attempts in containment have led to stronger environmental protection. Most notably for the western portion of the Metropolitan Area, the greenbelt and Drinking Water Protection zone act as Urban Growth Boundaries. Also, the Balcones Canyonland Conservation Plan has done well in containing growth along the western, scenic lands, yet the focus will be given to a potential, future regional development plan that can reflect the visions and goals of ECT.

Although attempts have been made, the Austin area continues to struggle in managing its growth. This is even more difficult considering the abundance of low-cost, vacant land in peripheral areas. Fortunately, there are many ways in which the Austin area will be able to glean lessons from other regions, case studies, and literature. The goal of this professional report is then, to discuss the potential implementation of UCS into the Austin Metropolitan Area and the beneficial impacts it could have in terms of combating the aforementioned adverse effects; this will be done at the context of the urban form, so social equity will not be of strong focus although it plays a key role in the need for UCS.

As the goal of this professional report is to draw implications for the Austin region in terms of strategies and lessons gleaned in order to achieve regional growth management, or UCS, the chapters will focus on one aspect that can play a contributing role. The chapters are structured as follows. Chapter 2 raises the question of why the regions in Texas could benefit from UCS and provides three indicators that are meant to be causal. Chapter 3 presents case studies and literary works that are meant to expand on the reasoning behind UCS. The case of the U.K. and their largely praised green belt policy is meant to explain how strongly UCS can still face issues with a weak sense of regionalism. Also, a discussion is provided for two Texas Council of Government's strategies for growth management in an effort to generate more implications for Austin. Ultimately, this chapter aims to answer the question of why UCS implications must apply to the Austin region, as opposed to the city limits. Chapter 4 focuses on the Austin region in terms of the historic events contributing to sprawl and the several measures aimed to controlling it. With Imagine Austin as the current citywide comprehensive plan, this chapter aims to answer the question of how does a lack of regionalism weaken growth management and what is the city doing to address it. Chapter 5 reviews and evaluates the regional plans for the Denver, Seattle, and Lexington (KY) areas through a modified comprehensive plan evaluation protocol in an effort to answer how a future regional plan for the Austin region should be structured and the UCS-based reasoning behind it. Chapter 6 condenses the four preceding chapters in an effort to answer the fundamental question of what lessons and strategies can apply to Austin for future regional-based, UCS. Furthermore, the concluding chapter, 7, restates the points made throughout the report and ends on a hopeful note for the future of growth management in the Austin region.

CHAPTER 2: TEXAS IS IN NEED OF URBAN CONTAINMENT

Introduction

This chapter presents the need for UCS in Texas through an expansion of indicators from an existing Ecocity Builders report. The indicators are separated into three main sections followed by an additional section on population growth trends in Texas suburbs. The data and analysis are not meant to imply causality, but rather serve to illustrate indicators of sustainability based on more sprawling vs compact growth situations. The first indicator being used will be the Urban Containment Index and Urban Sprawl Index; this indicator is at the scale of the Metropolitan Statistical Area (MSA). The second indicator being used will be the Access to Public Transportation. Out of the three, this second indicator wasn't always consistent in terms of boundaries, but the scale the report aims to achieve is at the city level. The third and final indicator being used will be the Travel Time Indicator and Planning Time Indicator; these are meant to be at the scale of the urban area, which doesn't include satellite cities in rural regions that MSAs account for. Through the indicative relationship, it was determined that cities with a type of UCS had more opportunities for public transit and were less severe in terms of urban sprawl.

Ecocity Report Indicators

Based on a 2016 report by the Ecocity Builders Organization, a framework was presented that is composed of multiple criteria which aim to achieve their goal of reshaping cities to be more self-sustained and resilient. The basis of the Ecocity standards is derived from a 2010 Vancouver workshop that involved the collaboration of "local government, community leaders, and industry experts" (*Ecocity Focus Lab Final Report*, 2016, 2). The outcomes were presented to an international audience and then underwent further refinement. The validity of the standards could be interpreted as weak since the initial determinations were based on the collaboration of local

entities within the Vancouver region. This is not the case given that the determinations were refined to international audiences twice. The results are meant to be applicable to any city or region rather than one with strong parallels to Vancouver, Canada.

The framework is divided into four main categories: Urban Design, Bio-Geo Physical Features, Socio Cultural Features, and Ecological Imperatives. The goal of this professional report is to discuss the need for UCS at the context of the urban form. Out of the four main categories presented by the Ecocity Builders Final Report, the urban design indicator and its underlying standards aligns closest with the context of the urban form. To adequately achieve a sustainable urban design, indicators are presented for the sub-category: access by proximity. Ultimately, the reasoning provided is that “the ability for residents to access daily destinations through alternative means of transportation improves energy efficiency and land conservation, improves street vitality and safety, and creates opportunities for physical activity” (*Ecocity Focus Lab Final Report*, 2016, 28).

The preceding rationale supports the need to become an Ecocity; other sections of the report present facts that can strengthen the case being made. The report emphasizes that "consumption and climate change are inexorably linked, [and that] about 43% of greenhouse gas emissions were associated with the provision of goods and food" (*Ecocity Focus Lab Final Report*, 2016, 20). The U.S. is largely a consumption based economy at "69%", and Texas alone would rank as the world's 10th largest economy (Amadeo, 2019, para. 2),(McIntosh, 2018). Through the aforementioned, Texas's growing notion of a consumption based economy aligns with the adverse impacts on climate change. Also, Texas's sprawling metropolitan areas, which will be covered in other sections of this chapter, means that there becomes a greater dependency on single occupancy vehicles. This strong reliance on SOV results in an increase of greenhouse gas emissions, thus

harming the environment. UCS can reduce the harm accounted for through the benefits of compact development. For instance, UCS isn't only meant to constrain urban sprawl, but also to incentivize inner city development be done in a compact and connected manner that results in an increase of density and a reduction in vehicle miles traveled (VMT). UCS play an important role in affecting urban commuting since compact, dense developments can better support alternative modes of transportation, and stronger regulatory systems increase levels of density, thus resulting in shorter trips. Although the reports provide no indication that the economy will stop being consumption based anytime soon, UCS can help combat the harmful effects by reducing VMT for SOV and promoting other modes of transportation including bicycling and walking.

The connection between consumption based economies and their adverse environmental effects were given elaboration since the basis of the following indicators are a result of the Ecocity Builders Final Report, yet there are many other aspects that call for UCS. Following the rationale in the previous paragraph, UCS can amplify densities resulting in a mix of uses and paving the way for more social interactions. Ultimately, UCS can also enhance quality of life.

The claim that UCS can reduce the drawbacks from urban commuting patterns such as the harm from their externalities is further solidified in a 2015 scholarly report titled: The Effects of Urban Containment Policies on Commuting Patterns. Sung Moon Kwon's report determined that polycentric cities can reduce the costs of commuting and traffic congestion, whereas those that are monocentric appear to have a lesser chance in this reduction due to the existence of one focal point. With the preceding argument, polycentric cities are those with multiple urban centers that host a large employment base and are often situated along transportation corridors. At a larger scale, the concept can is applicable to metropolitan areas in the sense that the core city could be one urban center and suburban communities are other urban centers. In addition to the comparison between

poly and monocentric cities, the report concluded that urban sprawl can increase the number of employment centers which in turn, also increases the regions commuting times. These determinations are certainly not for every metropolitan area, but rather a trend.

Reiterating the purpose of this chapter, three previously studied indicators will be presented to paint the picture as to why UCS is needed in Texas. This will be done by comparing the effects of the indicators for metropolitan areas of similar scales with and without containment policies. The three indicators that this chapter will adopt are: Urban Containment Index and Urban Sprawl Index, Public Transit Access, and the Travel Time and Planning Time Indexes. Furthermore, the MSAs that will be of focus are the following: Dallas, Houston, Austin, San Antonio, Portland (OR), Denver, and Boulder. The first five are from the state of Texas and serve the purpose of identifying and analyzing cities without containment, or rather cities with weak containment. The remaining four serve the purpose of identifying and analyzing cities with a form of containment. Denver and Boulder are relatively close to one another, but fall under two different MSAs; together they are included in one Combined Statistical Area (CSA). In terms of comparison, it is important to account for the different scales of the cities. Not all cities will be compared and caveats and limitations to the data will be discussed after.

Indicator 1. Urban Sprawl Index and Urban Containment Index

The first indicator entails the relationship between an Urban Sprawl Index and an Urban Containment Index; these are based on a 2015 study by Sung Moon Kwon, which aimed at establishing a relationship between Commuting Patterns and Urban Containment Policies. The results strengthened the concept of containment systems generating more compact and connected communities, but additionally found that really stringent containment policies have the potential to have an adverse effect on managing urban sprawl.

A factor that largely make up these indices is the job-housing balance (J-H ratio). Following the Ecocities Lab Final Report, in which numerous professionals collaborated to determine the best indicators to create a sustainable, resilient, and self-sufficient community, it was found that an equal job-housing balance plays a vital role in achieving their goal. An increasing imbalance in the job-housing ratio often plays a large role into the worsening of urban sprawl. It's not to say that an equal J-H balance is the solution to alleviating sprawl induced consequences, but "social problems are expected to decrease to some extent" (Kwon, 2015, 55). Again, the focus of this report is geared towards the urban form, yet it is worth recognizing that these issues can be made less severe through tackling the social aspect as well. In addition to the J-H ratio, the Urban Sprawl Index is created through incorporating commuting times into the equation.

The formulaic approach for the Urban Sprawl Index is as follows.

$$USIi = ((CV_{ijhr})/(CV_{jhr}))/((CV_{ict})/(CV_{ct}))$$

$$CV = \sigma/\mu$$

To break down the formula, coefficient of variation for J-H ratio is separated from the coefficient of variation for commuting time. In regards to the J-H ratio aspect of the formula, a specific individual MSA serves as the numerator, while the coefficient of variation of the J-H ratio for all MSAs serves as the denominator. The same formulaic process applies for commuting time. These two results are then divided to determine the Urban Sprawl Index of the metropolitan area being examined. Lastly, the Coefficient of Variation is determined by dividing the standard deviation (σ) by the mean (μ).

The Urban Containment Index (UCI) is based on a 2006 study by Robert Wassmer, which was also used in the report by Sung Moon Kwon in alignment with the Urban Sprawl Index. Ultimately, Wassmer did a study reviewing 452 urban areas in the United States, and separated the reviewed containment policies into four sections:

- Strong Containment with Accommodating Future Growth
- Strong Containment with Restrictive Future Growth
- Weak Containment with Accommodating Future Growth
- Weak Containment with Restrictive Future Growth (Kwon, 2015, 56)

Wassmer utilized data presented by Nelson and Dawkins and restructured it into simpler terms. Essentially, UCS with accommodating future growth means that the policy is structured in a way that can better manage anticipated population growth. Notable for a majority of cities in the United States, urban growth is inevitable, so if a place has a UCS that is relatively weak at managing the expected population growth, it is classified as restrictive future growth. UCI is defined as a measurement of how strong an urban containment policy and the planning interventions are for its respective MSA.

The formulaic approach for the Urban Containment Index is as follows.

UCIi = Ti *(SCRi + SCAi + WCRi + WCAi +SGMi)

In order to break down the formula, the focus will first be given to the variables within the parenthesis. Strong Containment with Restrictive Future Growth (SCRi) commences this section, and a maximum score of 4 is given since this is the strongest of the three remaining variables; this doesn't include SGMi (Statewide Growth Management Program). Strong Containment with Accommodating Future Growth (SCAi) follows SCRi, but a maximum of 3 is given to this variable. Next comes Weak Containment with Restrictive Future Growth (WCRi) with a maximum score of 2. The last of these four variables is Weak Containment with Accommodating Future Growth (WCAi) and is given a maximum score of 1. The variable Statewide Growth Management Program (SGMi) is given a maximum score of 5 if such a program is present within a state. SGMi is scored as 0 if there is no such program statewide. Having established the variables within the parenthesis,

the sum is then multiplied by the cumulative years after a region's first implementation of containment intervention (Ti). This outcome then results in the Urban Containment Index for a specific region (Kwon, 2015, 57).

Table 1.1 Value of Urban Containment and Urban Sprawl Indexes in 2000 and 2010

MSA	UCI 00	UCI 10	USI 00	USI 10
Dallas-Ft. Worth	0	0	2.02	1.73
Houston	0	0	1.73	1.69
San Antonio	0	0	1.24	1.34
Austin	0	0	1.3	1.19
Denver	30	130	1.78	1.35
Portland (OR)	180	270	1.59	1.69
Boulder (CO)	132	192	1.14	0.96

Source: Kwon, Sung Moon, "The Effects of Urban Containment Policies on Commuting Patterns" (2015). Dissertations and Theses. Paper 2303.

In regards to the UCI for Texas MSAs, there is little direction to go since the formula calls for the factors rated be multiplied by the cumulative years after a region's first implementation of containment intervention. According to the data, no major MSA in Texas has had containment intervention. In terms of USI for Texas MSAs, however, the data presented implies that Austin has been relatively better in terms of managing urban sprawl with a value of 1.19. Westward growth towards the hills, in Austin, has undergone multiple efforts in terms of growth management; this

could partially explain why Austin ranks so low. Additionally, it is the least populated MSA of the other 3 in Texas.

The Denver MSA, interestingly enough, has both an urban population and density greater San Antonio's, yet both are relatively close in terms of USI values. It becomes apparent that San Antonio's sprawl would be far more spread out if it had an urban population closer to that of Denver MSA. It would also be reasonable to say that commuting distances would increase as San Antonio's urban region would be much greater in distance if it were to meet the Denver areas population.

Indicator 2. Access to Public Transit

The second over-arching indicator to be analyzed for the purposes of this report is the access to public transit. This indicator served as one of those presented by Ecobuilders that would help achieve a resilient, self-sufficient, and sustainable community. In addition to establishing a UCS for a city or region, it is important that the local residents be provided with adequate means of alternative forms of transportation. Successful containment systems in which land uses are more evenly dispersed and built in a compact manner already serves as an incentive for local residents to travel less, but the immediate access to public transit, in addition to enhancing walkability, may further amplify the need to no longer rely solely on single-occupancy vehicles (SOVs).

To measure the access to public transit, a 2017 study by Junfeng Jiao establishing the Transit Deserts concept will be utilized. The purpose of this study was to identify areas in the nation's 52 largest cities in which public transit is severely underserved; conversely, it also generated data on areas in which transit is properly served and where transit considered an oasis. Unlike the first indicator, the Transit Deserts study reflected population within city boundaries for most cases. The caveats in boundaries for transit deserts will be discussed the end of this chapter.

The study's results were twofold. First, transit demand was spatially auto-correlated and second, there was a correlation between density and transit dependency.

Focusing on the first_study, spatial autocorrelation, the research team gathered and constructed variables from the accumulated data at the census block levels for household drivers, transit dependent adult household population, and transit population. The transit dependence index score, generated from the previous step, was then used to test for spatial autocorrelation through the use of Moran's I. The results were found to be significant in all 52 cities. In regards to the second_study, a Pearson's correlation test was used to determine a relationship between density and transit dependency, and the results were also significant (Jiao & Bischak, 2017).

Table 2.1 Spatial Analysis of Transit Dependent Population and Pearson's R for Density

City(s)	Population	Block Groups	Moran's Statistic	Pearson's R
Austin	1,052,159	556	0.551	0.931
DFW	2,721,091	1,795	0.311	0.926
Houston	3,973,917	1,841	0.311	0.963
San Antonio	1,595,114	954	0.319	0.924
Denver	2,355,686	1,597	0.348	0.878
Portland	674,068	468	0.317	0.842

Source: Jiao, Junfeng, Bischak, Chris, "Understanding the Spatial Distribution of Transit Captive Populations in 52 Major US Cities" (2017).

Note: DFW includes the cities of Arlington and Ft. Worth (in addition to Dallas). Austin, Houston, San Antonio, Denver include surrounding communities for spatial consistency purposes.

Based on Table 2.1 in reference to the Access to Public Transit indicator, several occurrences are being depicted. Cities with a Moran's Statistic indicator of higher value implies that there is a greater cluster of transit desert or transit oasis. It is therefore worth mentioning that a higher number doesn't necessarily indicate that the city has better access to public transit. Pearson's R, however, is arguably better as the value decreases. In Table 2.1, cities with containment (Denver and Portland) have a Pearson's R score lower than the Texas cities. This means that there are greater number of areas in which a resident can live to be able to access public transit. It must be reiterated that the Transit Deserts study has included some suburbs within a single

city; this will be mentioned in Section 2.7. Ultimately, these cities have more opportunities to live without having to solely rely on single occupancy vehicles.

Taking into account the differences in overall population, it is worth noting that the Austin area is less populated than the Denver area, not the overall Denver MSA. Recognizing this, Pearson's R tells us that more people throughout the Denver region are able to live in places with access to alternative modes of transportation. Conversely, Austin area residents have fewer opportunities to be supported by transit. The Denver region has a relatively weak UCS as classified by Wassmer, Nelson and Dawkins, but the weak UCI rating is also largely derived from the fact that it was implemented in the late 90s. Even with its weak classification, it seems to be doing better than Austin.

Indicator 3. Travel Time Index and Planning Time Index

The third indicator used in this report will be the Travel Time Index (TTI) and the Planning Time Index (PTI), which are derived from the Texas A&M Transportation Institute's 2015 Urban Mobility Report. This report provides a wide variety of indicators useful for transportation analyses such as annual excess fuel consumed, annual congestion cost, however for the purpose of comparing containment vs non or weak containment cities, TTI and PTI will serve as being most useful.

TTI, as defined by the Urban Mobility Report, "focuses on each trip and each mile of travel [and] is calculated as the ratio of travel time in the peak period to travel time in free-flow" (*Urban Mobility Report*, 2015). By this rationale, a city with a TTI value of 1.50 means that a 15-minute free-flow trip would take 22.5 minutes in the peak.

PTI, also defined by the Urban Mobility Report, is the "travel time reliability measure that represents the total travel time that should be planned for a trip" (*Urban Mobility Report*, 2015). The values generated were calculated at the 95th percentile, meaning that the 5% margin of error would equal to an estimated 1 day out of an entire month.

Table 3.1 5-Year Travel Time Index for Containment and Non-Containment Cities

	Denver	Boulder	Portland (OR)	Austin	Houston	Dallas	San Antonio
2014	1.30	1.20	1.35	1.33	1.33	1.27	1.25
2013	1.30	1.22	1.35	1.32	1.33	1.27	1.24
2012	1.30	1.21	1.35	1.31	1.31	1.26	1.24
2011	1.28	1.21	1.34	1.30	1.29	1.25	1.23
2010	1.29	1.20	1.32	1.29	1.28	1.24	1.23

Source: 2015 Urban Mobility Scorecard. Texas A&M Transportation Institute

Table 4.1 2014 Planning Time Index (95th Percentile)

San Antonio	2.12
Boulder	2.48
Austin	2.58
Dallas	2.65
Denver	2.97
Houston	3.13
Portland (OR)	3.27
Seattle	3.41

Source: *2015 Urban Mobility Scorecard.* Texas A&M Transportation Institute

The TTI and PTI indices from the TTI 2015 Urban Mobility Scorecard, like the previous ones, also portray a story on containment vs non-containment cities. Based on the Table 4.1, the PTI for Portland is ranked higher than Houston. Considering that Portland has a statewide Urban Growth Boundary and is significantly smaller in than Houston in terms of urban population, it may be expected that the PTI also be smaller. It is, however, relevant to reiterate the fact that Indicator 2 (Pearson's R) depicted Portland as having more opportunities for public transit accessibility than Houston. The PTI doesn't take other modes of transportation into account, so the fact that Portland has a lower Pearson's R than Houston, in addition to there being more opportunities for alternative modes, could indicate that it can be more efficient to use other modes in Portland as opposed to Houston. Ultimately, one of the major goals of UCS is to lower SOV usage.

Additional Trends

Texas continues to fail in addressing the consequences derived from a rapidly growing population seeing that outward expansions in the urban regions continues to prevail. It's not to say that there is no potential for the future of sprawling urban Texas. Some of the Council of Governments (COG) have acknowledged the disadvantages of sprawling regions and have planned solutions for the future.

To help illustrate the sprawling tendencies of Texas metropolitan areas, population changes in peripheral suburbs will be depicted. On May 2017, the U.S. Census Bureau released a list of the fastest growing cities in the United States between 2015 and 2016. Of the 15 identified, 6 were located in Texas. Additionally, these six cities were all suburbs of the four metropolitan areas that compose the Texas Triangle. The cities are as follows: Conroe (Houston), Frisco (Dallas), McKinney (Dallas), Georgetown (Austin), New Braunfels (San Antonio), and Cedar Park (Austin).

Table 5.1 Comparing Population Growth for Texas's share of the Nation's Fastest Growing Cities

	2017	% Change	2010	% Change	2000
Cedar Park	70,010	43.06%	48,937	87.87%	26,049
Conroe	77,086	37.15%	56,207	52.69%	36,811
Frisco	155,363	32.80%	116,989	247.00%	33,714
Georgetown	63,062	33.04%	47,400	67.26%	28,339
McKinney	164,760	25.66%	131,117	141.16%	54,369
New Braunfels	70,317	21.78%	57,740	58.22%	36,494

Source: 2017 5-Year ACS Data, U.S. Census Bureau, 2010, 2000 Census.

If Texas is to ever adopt containment systems to better manage urban sprawl, it must be done at the regional level. The data provided in Table 1 make it clear that suburban Texas is rapidly growing, and will certainly not help the problem of congestion. Furthermore, many of these Texas suburbs are not provided with efficient means of alternative transportation modes meaning that vehicle usage may only increase as population growth continues.

Caveats and Limitations to the Data

As earlier mentioned, the presentation of these indicators is not intended to reflect causality. They are rather indicative since there are certainly drawbacks for each of the three indicators identified that aid in making the case for containment needed in major Texas cities.

In terms of the first indicator, UCI and USI, it would've been helpful to be provided with data regarding the jobs-housing balance. This was used in determining the Urban Sprawl Index

(USI), so it would've been helpful to recalculate the indices for the cities provided and others that may have been of interest.

For the second indicator that was support by Jiao's study on Transit Desserts, there is a limitation in that boundaries for determining populations were inconsistent. For instance, the study used a Houston population of 3,973,917, but Houston's citywide population was 2,267,336 according to 2017 5-Year ACS Data. The population used by the study also doesn't account for adjacent suburbs such as Spring, Cypress, or Sugar Land. In the case of Dallas, the cities of Fort Worth and Arlington were also incorporated into the study, but other cities within the urban area (i.e. Plano, Richardson, and Carrollton) were not. It may be worth noting that Plano, Richardson, and Carrollton are served partially by the DART light-rail system, whereas Fort Worth and Arlington aren't. The data from the Transit Deserts study still helped support an indicative relationship nonetheless.

In regards to the third indicator of TTI and PTI, a limitation was that all modes for transportation were not accounted for. While the Texas A&M Transportation Institute has plans to release an update to the 2015 study that includes a greater share of modes, it will not be available until the fall.

Conclusion

Aside from the multiple limitations each indicator has, it does appear that Texas could benefit from the use of UCSs. To start, the second indicator tells the story of how cities with UCS have a greater chance in access to alternative modes of transportation. This is important as one of the adverse effects of urban sprawl is lengthier commuting patterns, and a greater reliance on SOVs. In regards to the presented USI, the cities of Houston and Portland were found to have the same value. This may be concerning since Portland, a region with stringent growth boundaries, has value

equal to Houston. However, the USI formula took into account a relationship between the Job-Housing ratio and a variation of commuting times. It is therefore, worth noting that the lengthy commuting times may not have included alternative modes of transportation into account (biking, rail), and biking is known to be popular in Portland. Ultimately, it was determined that suburbs of the four Texas metropolitan areas continue experience rapid population growth. In fact, six of the 15 fastest growing cities around the nation were suburbs of these four major cities. While the data may not have painted a clear picture, Texas is still sprawling and could be in use of regional UCS. Following sections will depict case studies and instances by several COGs that aim to combat sprawl, so the future of urban Texas is certainly not a sustainable loss.

CHAPTER 3: EXISTING CASE STUDIES AND LITERATURE

Introduction

This chapter aims to present existing literature and case studies pertinent to UCS and regional planning. The case of the U.K. and its relationship with the green belt policy will be interesting to dissect, since many of the issues resulting from the policy are relatable to the adverse effects of sprawl seen in the U.S. Proposals for combatting the unintended consequences are similar to those in the U.S. as well, since the goal was to restructure development to create more activity. Following the section on green belt policy, a literature review will be presented based on exurbanization and the need for regional-level planning. This chapter will conclude by illustrating regional-scale approaches in growth management for two Council of Governments in Texas, and outline lessons that the Austin area could benefit from.

Greenbelt Containment in England

HISTORY OF GREENBELT POLICY

Greenbelt policies in the U.K. predate the industrial revolution, but the adverse effects from an ever-growing urbanized area became apparent soon after the start of this era. Cities became crowded and their streets became polluted. As a result, Ebenezer Howard introduced the concept of Town-Country system where society could enjoy the economic advantages of urban life with the health and aesthetic benefits of country life (Prior and Raemakers, 2007, 585). This innovative idea soon underwent an innovative expansion with a need to preserve the natural environment and essentially contain urbanization as the U.K. greenbelt policy was soon introduced.

For the purposes of urban containment, in alignment with efforts to halt the adverse effects of urban sprawl, the greenbelt policy directly originates from the Metropolitan Green Belt (MGB) of the 1930s. The MGB, however, only applied to the Greater London area, which lead to the

expansion of the Greenbelt policy in 1947 through the Town and Country Planning Act. This enactment created a more practical "'planning permission' system, which provided a feasible alternative to [land acquisition] that could easily be applied to far larger areas" (Smith, 2015, 1). The Town and Country Planning Act applied only to the nations of England and Wales; the nations of Scotland and Northern Ireland enacted their own policies for greenbelts and were similar to England's. Soon after this Act was formed, "national government policy formally established the purposes and procedures of green belts in England" in 1955 (Prior and Raemakers, 2007, 585). The 1955 circular, in tandem with the Town and Country Planning Act, outlined three core elements. The one relating most to development patterns is "the requirement for local authorities to prepare development plans with a 20 year lifespan" (Sturzaker & Mell, 2018, 29). Local authorities would also be required to include and accommodate for greenbelts in their developed plans, which ultimately helped ensure that land wasn't taken away and the openness was preserved. This addition to the greenbelt policy did well in defining the green belts around towns and cities.

GREENBELTS IN THE U.K. TODAY AND THE EFFECT ON DEVELOPMENT PATTERNS

Having touched on the history of the greenbelt policy in the U.K., the following section will demonstrate the policy's current status and how it has influenced development patterns and the public's perception. Entering its current state, the greenbelt policy has remained largely unchanged as it continues to maintain the openness of the land that became greenbelt designated decades prior. At its core, the greenbelt policy had the fundamental goal of preventing urban sprawl by maintaining the openness of the land. The continual perseverance of the greenbelt has resulted in the following data. As of 2010, an estimated 13% of land in England are dedicated to greenbelts. This proportion is different in other nations of the U.K., ranging from a high of 16% in Northern Ireland to a low of 2% in Scotland (*History of Green Belt in the U.K.*, 2011, para. 3).

Having addressed the history of the greenbelts and where they stand today, it is important to mention how the lack of change for the policy has become a factor largely influencing the urban form of the U.K. and specifically England. The nationwide housing crisis in the early 2000s and the development that would support it has led to the creation of communities further out of the greenbelt area giving way to adverse effects including lengthier commuting patterns.

REPORT: THE CONTAINMENT OF URBAN ENGLAND

Peter Hall's journal report, The Containment of Urban England, discusses urban growth patterns in post-World War II England and the planning strategies developed to manage said growth. This study, published in 1974, analyzed England through different statistical analyses at different scales including population changes, land use surveys, and trends in employment and residential decentralization for urban regions. It then presents three direct effects of the planning process in England: containment, suburbanization, and the rise of land value within the greenbelt. This study is relevant and important for the purposes of this report since it identifies drawbacks from local-scale planning that could perhaps be remedied through regional level planning in terms of managing containment systems.

Upon expanding on the three interconnected effects of the English planning process, it is important to consider how planning at the regional scale would've helped in combating the unintended consequences. Through the first effect of containment, development underwent the “leapfrogging effect” (Hall, 1974, 403). Essentially, the limited space of land within the greenbelt provided an incentive for urban growth outside of the greenbelt's physical area. Suburbanization, the second effect, comes into play as "a product in part of those planning policies which deliberately aimed at the containment of urban growth" (Hall, 1974, 404). Given that the decentralization of residential patterns didn't align with the employment centers, commuting between inner city and

peripheral suburbs increased. While many of the suburban residents experienced lengthier commutes, it is vital to point out that the third effect, rise of land and property values, had a particularly hard impact on the low-income (often minority) families who lived in these outer ring communities since many didn't own a car. Additionally, the increase in commuting leads to other consequences such as a rise in air pollutants emitted by vehicles. These three unintended consequences of the U.K. greenbelt are worth recognizing since it is often helpful to combat decisions for the future by understanding the failures of the past.

Although more than 40 years old, the insight drawn from this report remains relevant. Peter Hall concludes his publication not with implications for local governance, but rather to emphasize a concern that result from the three unintended effects and the need to consider them for future planning processes. There is, however, consistent mention as to how local-scale decisions affected these consequences. Local authorities "were unlikely, in making their plans, to countenance decentralization of their successful commercial cores, which provided so important a part of their financial base" (Hall, 1974, 404). Had planning been done at the regional level, the aforementioned consequences could've been better managed since the outer-lying communities and their respective residents would've been involved in the planning process rather than just the inner core.

LIVERPOOL CASE

A case to focus on that has had both, successes and unintended consequences through the implementation of the greenbelt policy is Liverpool, England. Prior to the establishment of the greenbelt policy through the Town and Country Planning Act, Liverpool's administrative boundary had merged with some of the neighboring towns such as Sefton to the north and Knowsley to the east. The greenbelt, therefore, didn't impede on the connection to these other towns, but rather surrounded the area as a whole. Given that there are several other towns within relatively close

proximity to Liverpool, it is safe to safe that the land in which the greenbelt lies would've been urbanized had it not been designated to maintain its openness (Sturzaker & Mell, 2018, 70).

To reinforce the preceding argument, it becomes essential to expand on how the green belt policy has "affected the physical containment of the city, but not the functional containment" (Sturzaker & Mell, 2018, 70). According to the Office of National Statistics (ONS), there is a 66.7% rate of self-containment within travel to work areas (TTWA) in the U.K. (*TTWA*, 2015). TTWAs indicate designated areas where local populations would generally commute to for work purposes. Given that the rate falls at 66.7%, the remaining proportion would be found to work outside of the TTWA. In essence, this means that over 33% of commuting to work is done outside of their defined region of residence. Referring back to the case of Liverpool, many of the towns within close proximity to Liverpool are predominantly residential areas, with Liverpool containing the core employment center. "Although urban growth had been contained, suburbanization (defined…as residential areas moving further away from employment areas) had continued to take place" (Sturzaker & Mell, 2018, 70). Following this rationale, commuting patterns for those living outside of the green belt became longer, resulting in one of the issues that greenbelt policies aims to prevent. Clearly, Peter Hall's presentation of the unintended consequences from containment in urban England continue to prevail today.

Sturzaker and Mell have illustrated that a contributing factor behind lengthier commutes come from the problem of leapfrogging, among other factors. Additionally, a rising imbalance between residential communities and the economic base don't alleviate the situation. Leapfrogging, however, isn't entirely terrible given that many UK cities are connected through rail as a mode of transportation. "'Leapfrogging' is also not inherently unsustainable if a good transport network exists" (Hilliam, n.d., para. 30). This is the case for many satellite cities surrounding Liverpool, but

not all of them. The inclusion of rail into the situation is key as it can alleviate vehicle-based congestion nonetheless.

It is also worth noting that advances in technology can help in improving sprawl induced impacts in the future. "...people need the tools to be able to work remotely when they choose to do so. The growth of digital technologies reduces the impact of distance and allows appropriately skilled people to offer services from virtually any location…" (Hilliam, n.d., para. 29). Innovating technologies will help in alleviate some sprawl induced issues such as those produced by a job-housing imbalance. A lesser need to commute to work due to technological advancements means that people may be commuting shorter distances in the future, thus helping in congestion patterns.

PUBLIC'S PERCEPTION OF GREENBELTS

Sturzaker and Mell draw from multiple references to evaluate the public's perceptions on the greenbelt policy. To sum, it was determined that the perceptions are hybridized in the sense that some of the general public favors urban growth while another large portion favors land conservation. Those more opposed to greenbelt policies justify the reasoning by explaining that the landscapes "should be encouraged to diversify to meet socio-economic and ecological needs" (Sturzaker & Mell, 2018, 110). Additionally, there is a perceived sense of isolation that comes from living in small satellite towns that are separated from the core economic centers by greenbelts. This reasoning is certainly justified given that, as previously mentioned, residents must endure lengthier commutes. The following study serves as a potential solution to navigate around greenbelts and some of their unintended consequences.

CAMBRIDGE - MILTON KEYNES - OXFORD

The preceding issues mentioned in regards to Liverpool and the lack of economic productivity in its satellite communities ties in with the next case of the Oxford-Milton Keynes-Cambridge corridor. This study has been prepared by the London-based National Infrastructure Commission and has identified a wide range of issues and proposed solutions, such as intensifying town and city centers to make efficient use of existing infrastructure. For the purposes of this report, the emphasis of the Cambridge-Milton Keynes-Oxford study will be given to the section outlining possible strategies for coping with greenbelt conditions.

The satellite area in North Oxford, largely consisting of the town of Kidlington, has experienced drawbacks in that the existing greenbelt gives no room for urban expansion and the community lacks a form of identity. Upon developing solutions, it became essential to not undermine the function of the greenbelt or take away from the compact nature of the nearby host city of Oxford. “It is important that locations developed according to this typology have their own identity, sense of place, and local facilities (appropriate for the scale of the settlement) within walking/cycling distance, as well as having a primary connection to key locations within the host settlement” (NIC, 2017, 60). As seen in Figure 1.1, greenbelt areas 1 and 2 separate the towns in the northern Oxford area. In the next figure, we see a redefined area through a solution that proposed the following: locate most public and active uses along central corridors, build up the community character, and create mixed-use districts to support transit connectivity. The proposed solution, as seen in figure 1.2, not only considered the greenbelt, but also rather strengthened it. In fact, sections 1-4 of figure all aim to support the greenbelt.

Figure 1.1 Greenbelt Area Surrounding Kidlington

Source: (NIC, 2017, 62)

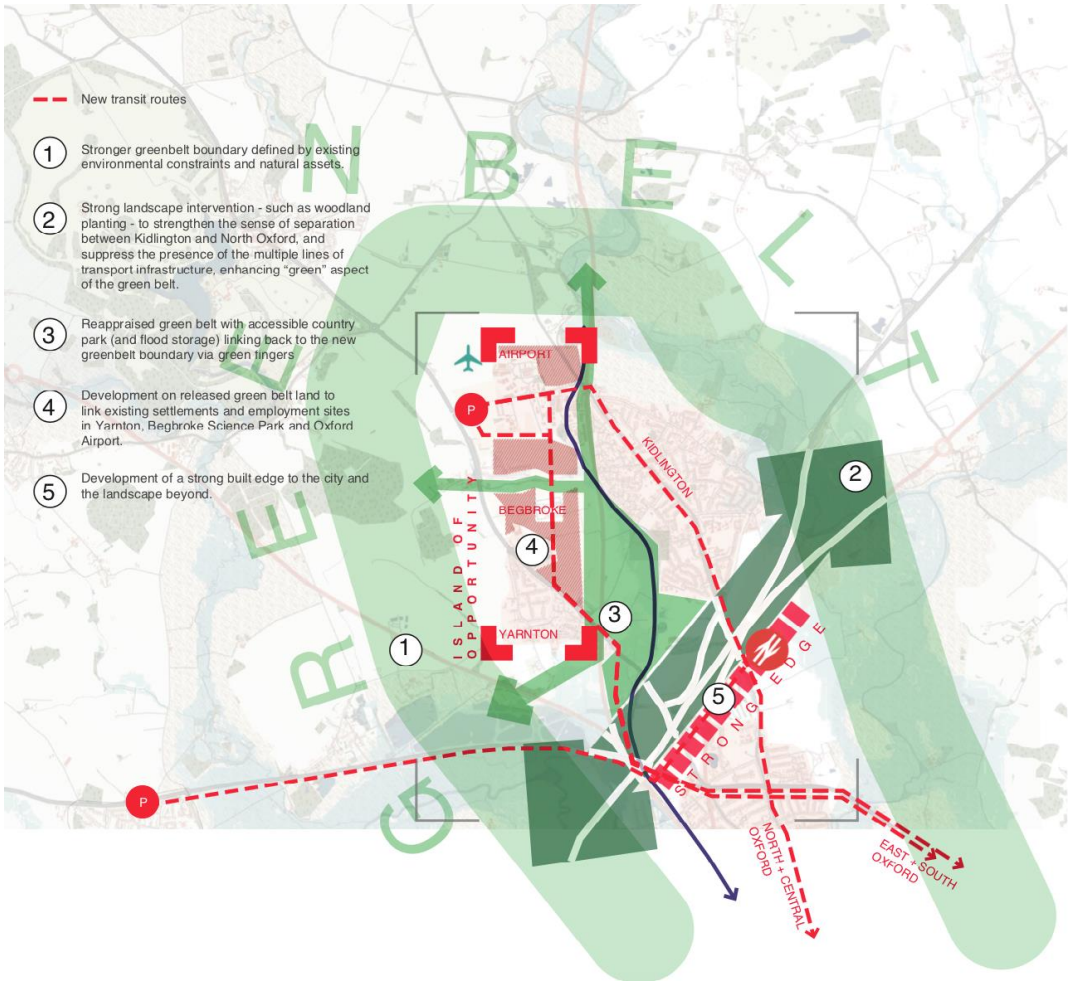

Figure 2.1 NIC Solution for Satellite City Revitalization

Source: (NIC, 2017, 63)

This solution proposed by the National Infrastructure Commission, worked around the physical constraints from green belts and restructured the settlement to concentrate the public and active uses along a central corridor that would also connect to other modes of transportation. The linkage of the satellite community to a transportation route further strengthens the vitality. If there was no rail connection, which is applicable to some satellite communities around Liverpool, the restructured development may still serve as beneficial. The restructuring of communities will be

explored specifically for the Houston and Dallas areas as their respective COGs have outlined some concepts that can bring life back to auto-centric centers.

Additional Readings to Regionalism and UCS Practice

UCS AND EXURBANIZATION

The Social Impacts of Urban Containment, published in 2007, was co-written by researchers Arthur Nelson, Casey Dawkins, and Thomas Sanchez; this book recognizes the fact that issues of UCS are largely geared towards the land use, transportation, and economic context which is why the authors seek to examine the social issues. While the focus of this report is to analyze UCS impacts at the urban form for select regions and draw implications for the Austin region, this book remains helpful as the urban-form is still addressed and large cities nationwide undergo a comparative analysis.

Chapter 4 of this books elaborate on the concept between UCS and exurbanization. The concept of exurbanization and its drawbacks are useful for this report considering that each of the cities and their respective comprehensive plans being analyzed contain suburbs and exurbs. Additionally, Imagine Austin recognizes many drawbacks for the region's future due to weak management over the areas outside of municipal boundaries (i.e. exurban regions. Otherwise known as Edge Cities, exurban development has been found to be amongst the least efficient urban form attributing to urban sprawl. In this form of development, "densities [are] too low to be served with public sanitary sewer systems or even public water systems in ways that are financially feasible" (Nelson, Dawkins, Sanchez, 2007, 49). Exurban sprawl also has low chances in supporting alternative forms of transportation, since similar to the issue of utilities, densities are too low. Nelson and Dawkins found that exurbanites must be willing to commute through single occupancy vehicles.

The writers ultimately found several factors that can push inner city residents towards the peripheral “exurban” areas. Among the first was the anti-urbanist attitude in the sense that people want to escape from “noise, congestion, pollution, micro-climatic conditions, ethnic and racial diversity, and crime associated with urban areas” (Nelson, Dawkins, Sanchez, 2007, 53). In addition to the anti-urbanist views, urban residents were pushed away from inner-city regions due to there being poor or no coordinated development within urban areas. "Most regions do not engage in coordinated land use planning with the result that local governments - usually cities and counties - go it alone in fashioning their development patterns" (Nelson, Dawkins, Sanchez, 2007, 54). Largely apparent in American metropolitan areas, development continues to be pushed out into peripheral areas resulting in an incentivized group of people to no longer feel the need to live in the urban core. All these reasons are worth noting since they help solidify the need for regional coordination when it comes to implementing an urban containment system.

Having given an understanding as to why people are pushed out of the inner core and pulled into exurbanized areas, Nelson, Dawkins, and Sanchez explain that continuous technological advancements could be a solution for the future. “For those wishing a rural lifestyle important advances in ‘property service’ technology make rural living possible” (Nelson, Dawkins, Sanchez, 2007, 53). Innovative technologies are not to be seen as a push or pull factor, since it could be applied anywhere. Rather, it can be seen as a strategy to reduce lengthy commuting patterns which is an adverse effect of urban sprawl.

REGIONAL PLANNING IN AMERICA

From the publication titled Regionalism in America by Ethan Seltzer and Armando Carbonell, many overarching themes emphasizing the need for regionalism are addressed. While

the title implies that lessons are meant for the U.S., some concepts presented can certainly apply to the United Kingdom or any urbanized region throughout the world.

Essentially, if any region, locality, community, etc. aims to achieve full sustainability, then regionalism planning would serve their best interests. Seltzer and Carbonell mention that in addition to economic competitiveness, regional planning is sensible and useful due to the fact that "the development and use of land, energy, water, and other resources immediately calls on the overlapping territories that comprise whole ecosystems (Seltzer and Carbonell, 2011, 1). Through this statement, it becomes clear that local jurisdictions within a single region, to say the least, are interconnected and the decisions made by one locality can affect another.

In the American context, issues in making decisions that overlap jurisdictional boundaries have the potential in raising political and cultural issues. "Issues of race and class are closely associated with jurisdictional boundaries and politics throughout the United States" (Seltzer and Carbonell, 2011, 2). The authors go on to explain that decisions that affect an overlap of these boundaries have the potential in resonating poorly with cultural or local values. Due to the aforementioned concepts, it becomes imperative to evoke a strong sense of inspiration and public awareness by having local residents understand that regional planning could serve in their best interests.

> "US regional governments are ineffectual by design, as they are given very little land-use power, no tax base, no direct representation, and no constitutional base. . . . Thus, in their role as a think tank, they may have an implied moral obligation to promulgate best practices and innovative land use policies. . . . [I]t appears worthwhile for COGs to produce these plans, despite the likelihood of repeated conformance failures" (Waldner, 2008, 697).
>
> Leora Waldner, Associate Dean for Strategic Innovation in the College of Arts and Sciences, Troy University

As Waldner, Seltzer, and Carbonell explain, regional scale planning can be difficult to achieve, but COGs can still undergo efforts in generating plans. In terms of containment efforts, this regional difficulty is more applicable for those regions without statewide growth management regulations. An overview of how Council of Governments within the Texas Triangle are making efforts in urban containment will be discussed in another section of this report, yet it is worth acknowledging that regional planning has been rather difficult in the United States. Such efforts made by the COGs deserve admiration, as they are a step in achieving sustainability. Finally, while the potential drawbacks in regional planning may not necessarily be the same in the United Kingdom, the reasons to strive for such large scale planning certainly apply.

GEOGRAPHY OF TRANSPORT SYSTEMS

Changes predominantly occur at the incremental level, and it is assumed that the future will rely on technologies that currently exist. The only difference being that these technologies would be "operating at an extended scale. The parameters of such an extrapolation commonly involve greater speed, mass availability, a higher capacity and/or a better accessibility, all of which imply similar or lower costs" (Rodrigue, 2016, 78). This statement makes it clear that regional scale planning may benefit from advanced technologies, as some concepts may be made easier such as being less costly. There is still a need to raise public awareness, but it is reassuring that steps are being made to achieve the goal of urban containment: full sustainability.

Texas Approaches in Containment

HOUSTON-GALVESTON AREA COUNCIL AND LIVABLE CENTERS

While Envision Central Texas lives on through decisions in Imagine Austin and CAMPO 2035, the Austin region remains relatively compact compared to Greater Houston in the sense that it occupies much less area. Greater Houston is “expected to grow by an additional 3.5 million

people [by 2035]" (*Livable Centers*, n.d., 2). The aforementioned projected population is put into better context when compared to Envision Central Texas projection of "1.25 million new Central Texans...within the next 20 to 40 years" (*A Vision for Central Texas*, 2004). With suburbs expanding greater distances at each direction outside of inner Houston, the Houston-Galveston Area Council (H-GAC) has enacted the idea of livable centers that can be adapted for rural, suburban, and urban settings.

The H-GAC livable centers are, as the name implies, places to "live, work, and play with less reliance on cars" (*Livable Centers*, n.d., 2). Livable centers have the central goal of lowering vehicular usage, but also differ depending on the context of the landscape such as urban, suburban, and rural. The three overarching themes that all livable centers incorporate into their planning process are being compact and mixed-use, walkable, and connected and accessible (*Livable Centers*, n.d., 7). Following this 3-themed concept, livable center planning undergoes a series of action steps that include determining funding mechanisms, reviewing existing plans and ordinances, and establishing design guidelines that could better fit the landscape the project pertains to. Such action steps can pose as constraints in seeing the project come to fruition, so H-GAC, in partnership with consulting firms, have devised several incentivizing strategies.

One method that has proven to be useful is the concept of temporary better blocks where locals may realize the benefits from revamping vehicle-centric streets to more pedestrian friendly areas by providing temporary amenities such as bike lanes and food trucks. "Instant impact projects can help build momentum by increasing public awareness and support. They are a good way to test new ideas before designs and policies are finalized" (*Instant Impact Guide*, 2016, 4). To put these ideas into context is in the example of Washington Avenue in the western, inner-loop Houston area. This temporary better block underwent 3 months of planning to close down some traffic lanes,

expand sidewalks, and set up attractions such as a farmers market and children-oriented activities. "The Washington Avenue instant impact project only took one day to set up, cost approximately $1,000, and attracted over 1,000 pedestrians" (*Instant Impact Guide*, 2016, 13). The temporary event benefited the local neighborhood since it resulted positive impressions to the residents; there is also the additional benefit of being low-cost in comparison to permanent projects. Furthermore, Washington Avenue is now in the process of becoming a complete street; proposed projects such as these have less obstacles if the local community is on board with the plan (*Instant Impact Guide*, 2016, 13). The temporary better blocks strategy is one of many that gradually helps bridge the gap between sprawling metropolis and densified communities.

NORTH CENTRAL TEXAS COUNTY OF GOVERNMENTS AND TRANSIT-ORIENTED DEVELOPMENT

Giving focus to the Dallas-Ft. Worth Metroplex, the North Central Texas County of Governments (NCTCOG) has utilized existing and future passenger rail infrastructure to their full advantage by adopting the concept of Transit-Oriented Development (TOD). Upon building around a rail station, benefits are similar to the livable centers in Houston as they include mixed-use development enhancing walkability and other alternative methods of transportation that aids in the reduction of automobile dependency. While the Dallas Area Rapid Transit (DART) light-rail system predominantly serves the City of Dallas and few northern suburbs, NCTCOG has plans for the future of the Metroplex by harnessing the benefits of TOD for other current and planned rail systems within the region in addition to DART light-rail.

NCTCOG recognizes three primary benefits of TOD as being transportation, economic, and health based. In the transportation aspect, NCTCOG explains that providing more destinations around rail stations means that there will be a lower need in single occupancy vehicle (SOV) use

since the destination will support more mode choices. In fact, the use of SOV could often be perceived as an inconvenience since some TOD-centered destinations have reduced parking amenities for reasons that include widening sidewalks for pedestrians. In the economic aspect, NCTCOG states that "investments around transit stations have high returns for businesses and taxpayers" (NCTCOG, 2017). There is also an advertise-like mention informing the reader of the potential costs that could be saved through the forfeit of SOVs. In the final aspect, health benefits are presented which largely reflect those of containment policies. TOD can foster opportunities that can reduce heart disease at the personal level and improve air quality standards at the regional level.

The advantages of regional scale planning are made apparent as transportation entities such as DART and Fort Worth Transit Authority (FWTA) have coordinated amongst each other to establish connections throughout the entire Metroplex. NCTCOG also depicts proposed rail lines including commuter and light-rail that would be key in developing more TOD sites in the future. Figure 3.1 depicts existing and planned rail services throughout the Metroplex that ultimately aid in meeting the goals of urban containment. Having TOD site throughout the entire region also helps in raising awareness to those not living within proximity to the current DART stations since they would be more spread out.

It's not to say that TODs need the transit to be successful. Rail as a mode of transportation clearly aids in reducing SOV trips, but urban, suburban, and even rural areas are still able to plan development that meet the same goals of TOD. Such is the case in H-GAC's livable centers whose concept was already elaborated upon. Furthermore, in a publication by UC Berkeley planning professor, Daniel G. Chatman, the point was made that as long as car ownership and use is reduced, the transit is not always necessary. Chatman states "Lower parking availability, better bus service, smaller housing units, more rental housing, more destinations within walking distance, better

proximity to downtown, and higher population and employment density all reduce car ownership and use" (2015, 21).

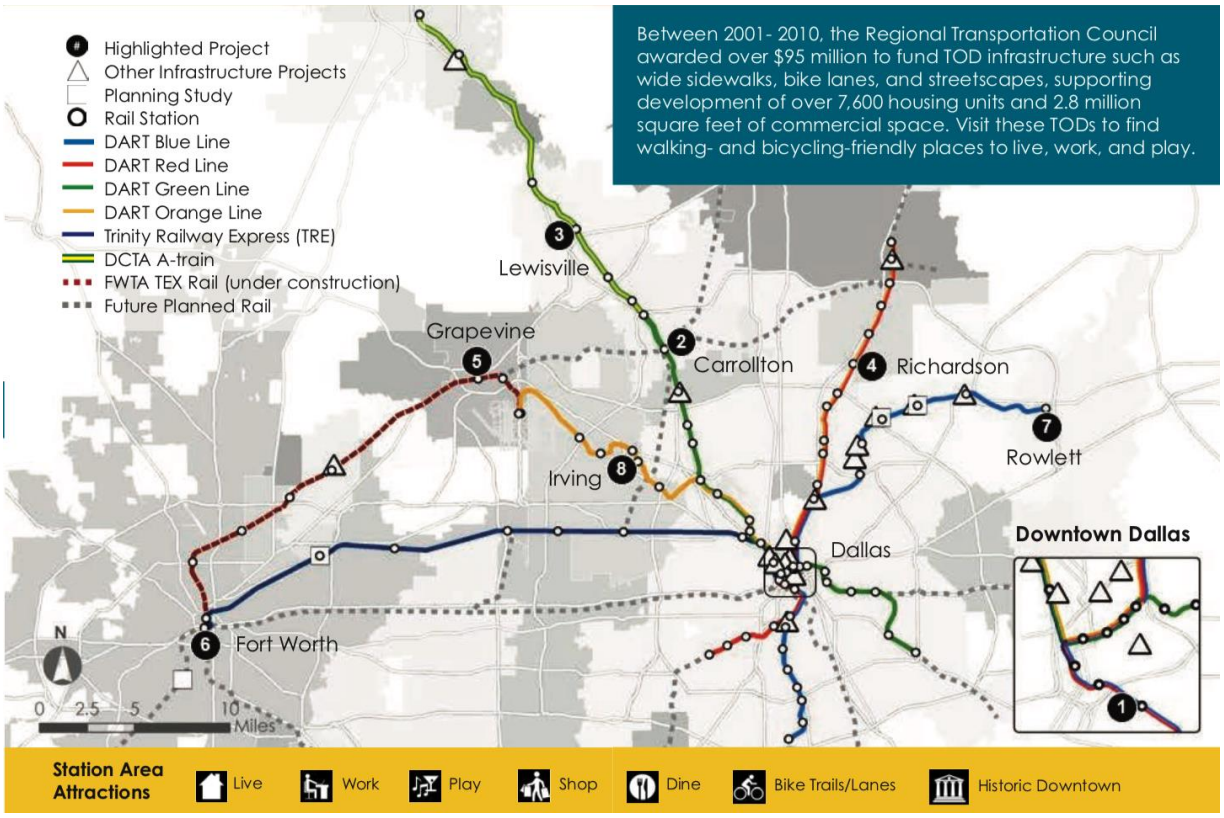

Figure 3.1 TOD Across the NCTCOG Region

Source: NCTCOG, 2017

TOD planning is not to be seen as synonymous with urban containment systems, yet it is apparent that the latter could be strengthened with the former. Furthermore, studies have shown that rail transit may not be all that necessary to have a successful TOD project. It would simply be TOD without the T. Such a realization means that these TOD practices can be implemented in any urban region within the Texas Triangle.

Lessons for the Austin Area and the Texas Triangle

At the context of the U.K. and it's green belt policy, it was determined that although beneficial for the physical containment, functional containment was perceived as being relatively weak since residents from satellite cities endured lengthier commuting patterns. Also, the lack of economic centers in many satellite areas resulted in a loss of a sense of identity. The proposed solution for the northern Oxford area, however, has taught us that restructuring the communities can make the aforementioned issues less severe. The lesson to be learned for the Texas Triangle and their sprawling tendencies is that restructuring communities can, not only alleviate these issues, but can result in an inspired community. Such concepts have been adopted by Houston and Dallas COGs as TODs and Livable Centers reflect the framework behind the proposal for the northern Oxford area.

In addition to combating issues within the urban areas, there is still a strong need for regional collaboration to strengthen the megaregion as a whole. Margaret Dewar and David Epstein's report on Planning for Megaregions in the United States condenses the reasons on why it is important to plan at larger metropolitan, or even regional scales, in order to achieve maximum potential. Rapid population growth, as notable in the Texas Triangle, "will pose enormous challenges to infrastructure capacity and environmental quality and thus economic competitiveness as well"(Dewar & Epstein, 2007, 118). With a strong need to manage rapid population growth comes a need to prevent urban sprawl as much as possible. Metropolitan scale growth management can aid in the alleviation from the several adverse effects that sprawling patterns generate which include water conservation, agricultural land management, air pollution, congestion and lengthier commuting patterns. It is therefore of the utmost importance to manage growth at the regional level to better strengthen the megaregion as a whole. Additionally, it will be easier to compete

economically with other megaregions of the world if internal issues are made less severe. Ultimately, both cases (Texas and the U.K.) have realized the advantages that come from this large scale planning, and while planning at the mega regional scale is not necessarily synonymous to planning at the regional scale, the advantages certainly triumph those of local scale planning.

Conclusion

Especially certain for states without growth management regulations, metropolitan areas will continue to face sprawling induced challenges for reasons including the fact that peripheral lands are less costly than inner city property. Green belts in the U.K. have solved these issues to a degree, but regional coordination is still necessary if the satellite towns are not to be forgotten. In regards to the Texas Triangle, efforts have been made in growth management as evident from the COGs. Furthermore, advances in technology should be seen optimistically as issues such as lengthier commuting patterns, can be made less severe. Overtime, it is reasonable to believe that the advantages of growth management will be realized by developers, city officials, the general public, etc., and megaregions, such as the Texas Triangle, will be able to compete with others whilst achieving complete sustainability at the same time. In regards to the Austin region and a potential application of UCS, strategies could be gleaned from the COG analyses; also, Austin is no different than any other region and must conduct UCS at a regional level.

CHAPTER 4: WHERE IS AUSTIN TODAY?

Introduction

The city of Austin has historically undergone several events that have led to the ongoing process of urban sprawl that is still seen today. Upon its upbringing, the city of Austin, like most southern cities, experienced a racial divide in that minorities had to use separate services and live in more dilapidated communities in East Austin or Clarksville neighborhoods. Several decisions in the early stages of plan making led to such racial divides and a separation of uses. The effects of sprawl became apparent as the shift from comprehensive planning went from encouraging growth to managing growth. Soon after the turn of the century, Envision Central Texas was formed. Shifting to the current date, the city continues to combat these long lasting effects through projects such as mixed-use centers.

Overview of Politics

1928 Comprehensive Plan: The Beginning

The issue of generating a comprehensive plan that aim to tackle concepts such as environmental matters, economic resilience, or social equity is not new for the city of Austin. In fact, following a 1928 city council discussion in regards to the development of a comprehensive plan, “the needs it discusses are still on our wish list today: better streets and sidewalks, meeting the growing city's demand for water and electricity, and providing the funding to pay for it all” (Gregor, 2010, para. 2). It’s not to say that the city has failed to learn from issues they have aimed to resolve in the past, but rather the rapidly growing population makes these issues resurface at a much larger scale.

This 1928 initiation in the development of a city level comprehensive plan can also be deemed as the foundation of two primary issues the city, or region rather, faces today. The first

aspect that truly set the region in a backwards direction towards making progress was its creation of racial segregation. Discussed earlier in the publication written by Seltzer and Carbonell, a reason as to why regional-scale planning can be difficult to achieve stems from the racial and cultural values that may not overlap jurisdictional boundaries. Additionally, complete sustainability will not be achieved if the social equity aspect is largely ignored; this is most important for the long term. The second aspect that is more pertinent to this reports purpose on the need for containment at the regional scale deals with the 1928 Comprehensive Plans creation of zoning ordinances. "The plan offered recommendations for public zoning regulations that encouraged separating residential, commercial, and industrial land uses. Under these new zoning rules, neighborhoods to the west, northwest, and north of the central business district were designated primarily for single-family residential developments, while those to the east and northeast were zoned for commercial, industrial, or unrestricted uses" (Tretter, 2016, 124). The racial segregation was certainly a misstep, but the separation of uses goes against the entire concept of mixed use developments; such developments are key in the alleviation of the adverse effects of sprawling metropolises today.

AUSTIN TOMORROW PLAN (1980)

Succeeding the 1928 Comprehensive Plan were a multitude of resolutions that involved the accommodation for the growing city and improvements on public facilities amongst other things, but the real change came in the form of the Austin Tomorrow Plan of 1979. This plan was developed by the newly formed city planning commission and made sure to account for ample citizen participation in the decisions presented. Even at a time in which inner-city cores were declining throughout the United States, a large basis behind the concerns voiced in the Austin Tomorrow Plan pertained to sprawling development patterns and how they "lacked identity and were threatening Austin's sense of community, stunning natural environment, and fiscal viability"

(Gregor, 2010, para. 6). While the previous resolutions were aimed at promoting growth, the Austin Tomorrow Plan largely reflects the beginnings of managing growth. The “framework for growth management proved largely ineffective” partially due to the retaliation from the business community (Tretter, 2016, 134). Lastly, the Austin Tomorrow Plan aimed to manage growth, but only for the area within the city limits. Steps continue to be taken in the context of comprehensive plans to manage growth, as will be seen in Imagine Austin and Envision Central Texas in the following sections.

Envision Central Texas

The following section will focus on Envision Central Texas, the Austin region-wide organization that aimed to achieve regional cooperation and ultimately manage growth for the future. Many concerned locals within the Austin region have historically recognized the need for a regional plan, leading to the creation of Envision Central Texas (ECT) in 2001 that served the counties of Travis, Williamson, Hays, Bastrop, and Caldwell. As a non-profit, ECT utilized land-use and transportation technologies and public involvement mechanisms to propose different scenarios for the future of the Austin region. Today, ECT no longer exists, but there are several lessons that could be learned from its short lifespan.

The documented plan, released in 2004, further explains the need for its vision and the features behind it. Such outstanding features that ECT hopes to achieve include environmental protection, an effective and multimodal transportation system, a diverse economy with ample job opportunities, mixed and affordable housing choices, neighborhood and historic preservation, and "actions that demonstrate an understanding that social equity and racial harmony are important values that strengthen the region" (*A Vision for Central Texas*, 2004). This last feature is important to highlight as it emphasizes why all citizens should be made aware of how regional-scale planning

would benefit all. Some aspects of the ECT document that plan-makers agree need more focus include closing the gap for underserved people at the equity context, prioritizing all children for achieving success, and an appreciation of cultural differences. To achieve full sustainability, the plan should incorporate more goals in social equity.

ECT developed four scenarios that could help the reader understand the potential consequences of unmanaged growth at the regional scale. These scenarios were a result of land-use technologies, transportation technologies, and public participation. To add, the plan emphasizes Austin's rapidly growing population that serves beneficial in generating a sense of alarm and inspiration for the reader. Scenario A essentially paints the picture for Austin's future without any growth mechanisms which result in a low-density sprawling region. Scenario B focuses the urban growth along existing transportation corridors. In Scenario C, there is a similarity to B in that it also concentrates growth along transportation corridors. Aside from this, scenario C emphasized more redevelopment, mixed-use, and infill development than Scenario B. Furthermore, Scenario C proposed that new towns be built along transportation corridors. In Scenario D, growth would be concentrated in the urban core, and not involve new satellite communities. Infill, mixed-use, and redevelopment would be focused on greater than in Scenario C in order to achieve greater densities. Lastly, Scenario D offers a greater share of transportation options including commuter and light rail systems. The result was a preferred scenario that combined B and C at the scale of D.

Electronic and mail type surveys were administered to regional citizens in order to generate the status of the public's perception on the different scenarios and overarching goals. Following a response of over 12,500, the public general concern consisted of a concern for growth management, more choices in housing, transportation, and employment opportunities, and a continued involvement in the planning process.

Given the non-profit status of the Envision Central Texas entity and the fact that the scenarios were to be considered as recommended rather than regulated, it was ultimately up to the localities to abide by it or not. This was in addition to constant cooperation and coordination with other localities in the 5-county region. The fact is that the nonprofit dissolved, but it's worth acknowledging some moral victories that they accounted for.

It is evident that the goals and visions of the ECT plan came with good intentions and sought to unite the regional residents to think at this larger scale. Nonetheless, the ECT plan and organization itself realizes that it isn't enough to present a vision; it must be made to work. Additionally, the plan lacked specifics such as where the open space will be designated. Member of the ECT Executive Committee and the Hill Country Conservancy, Robin Rather, brought attention to the committee by expressing the need for more help if regional planning is to be achieved. While she was critical on the plans overwhelmingly visionary focus, she stated that there is solace in knowing that the general public may have a heightened sense of awareness. "Simply getting the message out that there will be a lot more people here, and that we have to do a lot of work to accommodate them, is a huge moral victory. That alone is worth the effort. ECT gives us a chance to respond to growth that we may not have again." (Clark-Madison, 2003). Robin, like many of the ECT creators, understand the difficulties that come from regional planning.

Aside from this moral victory, the plan played a massive role in the development of the 2006 Travis County Greenprint for Growth and the CAMPO 2035 Sustainable Activity Center Plan. The former included more green space in proposed residential developments, and the latter sought to align transportation based decisions along different activity centers throughout the region. Furthermore, Imagine Austin has recognized the limitations of the city-level plan due to a lack of regionalism, but it becomes easier to make regional-based decisions with strong support from the

public which calls for a need in raising awareness. Although ECT dissolved, it is fair to say that there is a stronger awareness for regionalism now than before the time of ECT.

Imagine Austin Plan

In realistic terms, it wouldn't be just to compare the Imagine Austin plan on the same scale as DRCOG, Puget Sound, and Lexington-Fayette since the latter three are based on a more regional context. Austin is the economic, cultural, and vibrant center of Central Texas, as the plan acknowledges, but the suburban and exurban sprawl continue to generate consequences that makes this plan weak compared to the three regional ones. Having presented the aforementioned rationale, the evaluation of Imagine Austin will not be through Bunnell and Jepson, but simply through the context of the plans efforts at regional scale containment. While UCS is not formally adopted in Austin or the metropolitan area, there remain many aspects of the plan that are clearly directed at managing growth, which largely aligns with the goals of UCS.

IMAGINE AUSTIN PLAN: THE RECOGNITION OF WEAK REGIONALISM

Within Chapter 2 which is titled Experiencing Austin: Who Are We Today?, the multiple overarching themes that arguably promote a complete sense of sustainability when practiced efficiently are of focus. Some of these themes include housing, transportation, economy, and environmental resources. At the end of this chapter, however, there is an acknowledgement of regional perspective and the issues that will continue to grow if regional-level planning continues to be weak.

The following serves to depict how the plans efforts in communicating future outcomes that result from a lack of regional planning. Through a lack of regional-level planning, or even at a weak context, the plan emphasizes that aspects including agricultural land preservation, water

supply, job-housing balance, housing and transportation costs, and job opportunities will continue to worsen.

To elaborate on agricultural land preservation, the continual expansion of satellite-like subdivisions and commercial centers continue to take place on land outside of Austin city limits. A massive hindrance in this is that "fragmented, low-density development outside of the municipalities is more costly to serve with infrastructure and services, requires residents to depend exclusively on the automobile to travel, and encroaches on and consumes the regions open space" (*Imagine Austin*, 2012, 73). Additionally, the exclusive dependence on automobile travel is harmful to the environment and only worsens the issue of congestion that is Austin is known too well for.

In regards to the detrimental effects on water supply and water systems that come from a weak sense of regionalism, Imagine Austin states that the "limited availability of public water infrastructure reinforces scattered, sprawling development and new draws on groundwater sources will affect the region's water supply, particularly in times of extended drought" (*Imagine Austin*, 2012, 74).

The following two indicators of a job-housing balance and rising costs in housing and transportation are much interconnected that they must be discussed as one. The job-housing balance, or in this case imbalance, is one of the key indicators that can aid in the alleviation of urban sprawl. Imagine Austin points out that during the 2002-2009 time period, "Austin has seen its share of residents commuting out of the city grow [at 9%]" (*Imagine Austin*, 2012, 74). This statistic doesn't account for all the commuters traveling into Austin from surrounding suburbs. A stronger imbalance in the job-housing indicator, as Imagine Austin illustrates, is largely due to the second following indicator of rising costs in housing and transportation. Rising transportation costs have "created financial burdens for many households that moved to Austin's periphery to secure

affordable housing, but now find themselves farther away from jobs and needed services and able only to travel by car" (*Imagine Austin*, 2012, 74). The issue surrounding the preceding statement is only heightened as the inner city continues to rise in land value.

The next indicator which serves as complementary to the issues from rising transportation costs is the following: few regional transportation options. Alternative forms of transportation such as a light-rail system continues to be a debate within the city itself, but for those moving to peripheral areas largely due to affordability issues means that any opportunity to be serviced by other transportation options becomes omitted. "Too many people live and work in places where densities are too low to support regular transit service or are outside of a transit agency's service area. In many places served by transit, the routes and the frequency of service are so limited that people do not view it as a viable alternative to driving" (*Imagine Austin*, 2012, 75). Taking the initial indicator into account, the lack of alternative transportation services will continue to increase as low-density development prevails in peripheral regions.

The second to last indicator that also adds on to why people continue to move to peripheral, low-density areas is regional job growth mostly in lower-wage positions. There is recognition that a contributing factor as to why the inner Austin region has seen substantial economic growth comes from the rise of high-tech level jobs. These jobs aren't necessarily achievable for those affordable seeking, peripheral residents, but they do come with an increase in service-oriented jobs. The issue remains that the inner city region is largely unaffordable, so those seeking employment in through these lower-wage, service-oriented jobs would still need to maintain a lifestyle. "Households faced with lower-paying jobs and increasing housing and transportation costs are experiencing greater economic stress" (*Imagine Austin*, 2012, 75). Ultimately, this issue along with the five preceding it are interconnected, and must be the issue of sprawl can't be alleviated with the focus of only one.

On a textual aspect, Imagine Austin's stance on regional-based issues concludes with an overview of the "different legal powers to regulate development" (*Imagine Austin*, 2012, 75). If regional-based decisions are to be implemented there must be a strong sense of coordination with the regions multiple local jurisdictions. Additionally, it becomes easier to make such decisions with strong support from the public which calls for a need in raising awareness. Imagine Austin mentions that yet another hindrance comes in the limited powers from counties. "Texas counties have only the ability to regulate subdivisions, on-site sewage systems, floodplain development, and water supply. A few, such as Travis County, have the power to require storm water management, impose fire codes, and develop standards for water wells to prevent groundwater contamination" (*Imagine Austin*, 2012, 75). Evidently, a county has limited abilities to manage growth, and as Imagine Austin has already recognized, much of the sprawling patterns occur in areas outside of municipal boundaries.

IMAGINE AUSTIN ON GROWTH MANAGEMENT

Although not at a regional scale, the Imagine Austin plan takes several measures to tackle growth within city boundaries. Such methods are ultimately depicted through the Growth Concept Map that takes into account environmental resources, bike and pedestrian networks, transit networks, and roadway networks throughout the city. Through multiple efforts in public engagement, such a map could be created. Yet, limitations prevail as there remains a lack of regional coordination and many of the aspects incorporated into the maps still aren't realized seven years after the release of Imagine Austin.

Aside from an extensive public engagement process, the Imagine Austin Growth Concept Map was created through existing development patterns, planned projects, and small-area plans, as well as environmental features, and existing and planned transportation networks" (*Imagine Austin*,

2012, 96). This strategy resulted in the creation of 5 different scenarios that underwent further review from the general public and local officials. This led to the creation of the presented map which reflects the need for compact and connected development, increased accessibility to destinations, a reduction of commuting patterns, and multiple other indicators pertinent to urban growth management. The conceptualized growth concept map includes bicycle and pedestrian routes that improve connectivity throughout the city for alternative modes of transportation. The map also includes a more efficient set of transit networks that aim to connect the city activity centers and corridors. Furthermore, the map "seeks to direct development away from sensitive environmental resources, protect existing open space and natural resources, and improve air and water quality" (*Imagine Austin*, 2012, 97).

To dissect the growth concept map at a visual level, the citywide maps for environmental resources, bike and pedestrian networks, transit networks, and roadway networks are separately provided. It is worth noting that maps such as the transit one include a multitude of planned passenger railways. Released in 2012, there remains no expansions in rail transportation for the region or the city aside from the Capital Metro Commuter Rail which existed prior to the release of imagine Austin. This map has also adopted the concept of regional centers which are to be areas within the city to harness the greatest mix of uses, density, and activity. This name is misleading as they are designed for a citywide conceptual map, rather than a regional one.

This map is visually similar to the Puget Sound Regional Concept Map, which will be discussed in a later section, yet the latter includes the 5-county area and actually has a UCS at place. It seems that Imagine Austin growth concept map has been too similar to other regional based concept maps given that Austin's includes the concept of regional centers. The plan classifies regional centers as areas that are expected to "become the retail, cultural, recreational, and

entertainment destinations for Central Texas" (*Imagine Austin*, 2012, 104). Upon a re-examination of the map, the regional centers are located only within Austin city limits. Georgetown and Round Rock, both rapidly growing suburbs to the north, have rebranded themselves within recent years attracting a multitude of amenities. In fact, Round Rock is often considered a city itself, rather than a suburb, as it has become a tech center and home to a baseball stadium. Ultimately, Imagine Austin's Growth Concept Map is misleading since it doesn't account for areas outside of the city that have certainly experienced substantial growth on multiple accounts.

Even with the elaborate growth concept map, the reader is still left with the primary key challenge of "Counteracting the prevailing trend of sprawling development that consumes vacant land and natural resources, reduces air and water quality, contributes to global warming, and diminishes the natural environment" (*Imagine Austin*, 2012, 116). Furthermore, 7 out of the remaining 9 key challenges reflect managing development more efficiently. It is admirable that the city is doing what it can to combat urban sprawl, among other things, but it becomes difficult to foresee this come to fruition especially considering the many obstacles that come from a lack of regional-scale planning.

Conclusion

This chapter has addressed the Austin relationship with growth management and serves as an example on how historic decisions make current recovery very difficult. ECT has done well in informing the public, but the Austin region has experienced rapid population growth since then and is in need of a second awakening. Additionally, Imagine Austin has recognized the drawbacks that come from a lack of regional-level efforts in growth management, yet the Growth Concept Map and their centers of growth aim to do its best. The following section aims to analyze the regional plans for Denver, Seattle, and Lexington in efforts to draw implications for the Austin region. This

is in addition to the previous case studies, literature, and concepts utilized by the Dallas and Houston COG.

CHAPTER 5: REGIONAL PLAN EVALUATIONS

Introduction to the Plan Evaluation Chapters

The following chapter focuses on the regional plan evaluations for the Denver, Seattle, and Lexington (KY) areas. The plans will be evaluated at the regional level since urban containment systems at the local scale will be less successful as conflict could arise with surrounding jurisdictions due to lack of coordination among other things. Additionally, UCS at the scale of the core city won't deter suburban and exurban sprawl for those municipalities in which the growth controls don’t apply. This evaluation will consist of the following. First, a review of the cities at focus will be done by briefly addressing the political history; this is helpful to understand how similar the political climate could be to Austin's. The second step will be to identify the main points of the comprehensive plan and what it seeks to accomplish. This will also be brief through a review of the respective vision statements and how they tie into UCS. The third step will be an evaluation that comes from a part of the Bunnell and Jepson Plan Evaluation Protocol. The grading system is meant for entire comprehensive plans, but since the focus of this report is urban containment and its impact on urban form, the protocol will be reduced. The section concludes with scorecards for each plan and a brief overview of the implications for the Austin region; this will be evaluated in greater detail in the following chapter.

The sections regarding the Bunnell and Jepson Plan Evaluation Protocol will be structured in the following way. Given that the majority of the questions on the evaluation sheet pertain to four overarching themes, the analysis on the regional comprehensive plans will be separated into four subsections, with a concluding section to address miscellaneous factors that may have been unaccounted for. Subsection one entails Inspiration and Engagement. The plan as a whole should be visually compelling, creative, and convey the essence of the identified goals; this should be the

same for the aspects pertaining UCS. Subsection two entails the recognition of uncertainty in the sense that the forecasted scenarios address their limitations. Also, this subsection should explore how and if UCS has influenced scenarios. Subsection three aims to identify alternative courses of action and their intended outcomes. While similar to subsection two, this section focuses on the qualitative rather than the quantitative aspect. It won't address, for instance, population projections and their relationship with UCS, but rather how different policies or decisions will shape the outcomes. Subsection four will focus on the narrative aspect of the plan. It is imperative that the plan convey, to any reader, an understanding of the regions identity and how decisions reflect the need to preserve it. In the UCS aspect, subsection four will focus on a historic narrative of the region that revolves around containment.

Denver

The first region to be analyzed will be Denver; its bottom-up approach to UCS is the closest in terms of political landscape to the Austin region since Colorado (like Texas) doesn't mandate urban containment. The Denver Regional Council of Governments (DRCOG) is amongst one of the oldest council of governments, dating back to 1955. DRCOG serves 10 counties and is "not a unit of government, nor does it have statutory authority to require local governments to be members or follow its plans" (*Metro Vision*, 2017, para. 1). While DRCOG isn't an authoritative government, it still plays a key role for the future of the region. Some of the aspects that this entity plays a vital role in include preparing the long term plan for the regions physical development, planning for the regions aging and disabled population, and collaborating to provide input for the short and long term transportation plans. For the purposes of this report, the focus will be given to DRCOG's long term plan on the region's physical development, Metro Vision, and how it accommodates for the regions UCS.

To further promote the need for UCS in the Denver Region, the Mile High Compact organization was created as an agreement among 25 municipalities from the five counties. The Mile High Compact aims for participating communities to achieve the following:

- Adopt a comprehensive land-use plan that includes a common set of elements
- Use growth management tools such as zoning regulations, urban growth boundaries and development codes
- Link their comprehensive plans to Metro Vision, which outlines regional growth management
- Work collaboratively to guide growth and ensure planning consistency (*Metro Vision*, 2017, 3)

[R] INSPIRATION AND ENGAGEMENT

The vision statement is within alignment of the goals of UCS, and given its presence in the document as a subcomponent for the overarching vision, it certainly conveys the essence of the community.

> "Our region is a diverse network of vibrant, connected, lifelong communities with a broad spectrum of housing, transportation and employment, complemented by world-class natural and built environments." -Vision Statement (*Metro Vision*, 2017, para. 4)

At its start, the regional **vision statement** conveys many aspects that the regional section in Imagine Austin had difficulties achieving. Through the mention of broad spectrum of housing, transportation, and employment, the regional issues of jobs-housing balance and transportation options appear less controversial in DRCOG than Austin. It is likely that Austin suburbs like Cedar Park and Round Rock have strong economic bases and housing as well, but the DRCOG vision of having their communities connected could arguably triumph Austin since it continues to endure

issues at achieving regional scale planning and coordination. As supported by the indicators in Chapter 2, a balanced job-housing ratio, and broad spectrum of housing and transportation options are necessary to achieve a prosperous UCS. Firstly, densities are amplified, thus reducing VMTs. Secondly, the regional context means that progress becomes more feasible, which is something that future planning for the Austin region should aim to achieve. The Denver area-based general reader will likely have no knowledge on Austin's status in the regional enterprise, yet the DRCOG vision statement is simple and inspiring to say the least.

In continuation of respects to regional UCS, Metro Vision presents a range of landscapes from aerial and bird's-eye angles portraying the vast array of development in the region. These range from the compact downtown Denver to sprawling single-family neighborhoods. The goal of these **images** are to depict the diverse development patterns that contribute to Denver's urban footprint, but it would benefit the reader if there were more explanations as to how the sprawling patterns can lead to multiple adverse effects. Furthermore, more than a half of the page where the four pictures are found is left blank; there is definitely room for improvement here, literally. Such an explanation would be useful for the plan since it has greater chances in inspiring the readers that may not necessarily understand the adverse effects from the visuals themselves. This understanding can aid in having the reader make a connection as to why UCS is needed and can not only benefit the region, but themselves as well.

Aside from images, the plan uses **maps** seldom. Among other criteria, the first Theme of the plan aims to convey why UCS at the regional scale makes sense and what steps must be taken to strengthen it. Already, there exist images depicting the different development patterns, but maps reflecting the changes in urban footprint throughout different periods of time could better illustrate the situation. Additionally, the plan mentions that the "Denver region's urban footprint expanded

rapidly during the 1980s and 1990s" (*Metro Vision*, 2017, 15). On the plans theme focusing on the environmental aspect, there is a map depicting the open space throughout the 5-county region that differentiates between federal, state, local, and private ownership. While it is a positive that the plan has included this map, a drawback has to be similar to the lack of maps portraying the change in urban footprint overtime.

At large, the visuals of this plan are weak, but the **text** remains compelling. For the UCS context, there are pointers applicable to regional collaboration for regional and local organizations. It isn't enough for the regional entities to coordinate, there has to be agreement with the underlying local entities. A potential drawback that may limit the achievement of the goals stated in the plan is the voluntary approach behind them. A reader fully aware of the potential obstacles that come from a voluntary-based UCS may have a weakened sense of inspiration and engagement. Such is the case with Envision Central Texas and the Austin region. The preceding rationale is all the more reason to take advantage of the plan by inserting more maps and images that can serve better at inspiring the reader. Nonetheless, simple measures in terms of the organizational structure of the plan can benefit the reader by having them understand why UCS at the regional level can serve in their personal interest.

[U] RECOGNIZE UNCERTAINTY

The goals of UCS, as the plan has established, seek to ensure compact and connected developments, but there are some drawbacks. The plan admits that the Urban Growth Area has "not been **evaluated** in nearly a decade" (*Metro Vision*, 2017, 15). Although it recognizes the infrequent occurrence of evaluations, there should be more emphasis on how to be more consistent. A heightened sense of inspiration and engagement is useful for this section as well considering that an inspired reader would grow concerned over the fact that DRCOGs growth boundaries are not

frequently evaluated. Furthermore, the urban containment index indicator points out that UCS with future restrictive growth are more prone to experience drawbacks in the future. The reader may not necessarily know this, but planners who've contributed to DRCOGs Metro Vision should understand that this lack of evaluation presents a limitation.

A key aspect in evaluating the degree to whether or not Metro Vision recognizes uncertainty comes from **population** forecasts. It will be important to investigate whether population forecasts recognize what the Denver region could look like with a lack of or weaker UCS. Following an extensive search, Metro Vision doesn't present population projections in a visual manner, but rather simplifies it through text. "By 2040, the region's population is forecasted to increase nearly 40 percent, from around 3 million to approximately 4.3 million people" (*Metro Vision*, 2017, 4). While there is a sense of assurance that DRCOG is partly basing their objectives around the growing population, there is still an issue in that the plan doesn't acknowledge potential limitations that could hinder this population growth. For population growth, alternative outcomes in the event of "what-if" scenarios are helpful since DRCOGs UCS is voluntary-oriented.

[P] Alternative Courses of Action and their Different Outcomes

Alternative growth scenarios, as evident in the plan, played a major role in determining the updates for the DRCOG Metro Vision. In 2007, DRCOG "explored future scenarios reflecting different land-use and transportation policies" (*Metro Vision*, 2017, 16). The plan mentions that some scenarios posed greater threats to the region since the urban footprint was expanded. What is striking is that there is no reference to what these pernicious scenarios entailed. Although the reader is led to believe that the updates to the plan are in the best interest of the region, proof, such as the lack of scenario explanations, is not provided. Also, the different scenarios are not found in the appendix section. It's not to say that the plan-makers are being accused of providing false or

misleading information, but that reasoning behind decision making could be strengthened by providing clearer scenarios. An elaboration of the different scenarios helps the reader by providing real-world examples that can be remedied through UCS. Rather than being given general definitions, the real world examples have more of a personal appeal that arguably makes it easier to understand.

Aside from the plans presentation of alternative growth scenarios and the many factors that may influence them, an emphasis will be given to how this plan aims to **monitor** these decisions. Monitoring is important as it can aid in identifying potential problems at early stages making it more feasible to remedy. In order to help meet the goal of containing urban development, DRCOG has provided a supporting objective emphasizing that monitoring and heightened awareness will be needed. While it is reassuring that the need for monitoring has been identified, it should be reiterated that the efforts are still voluntary.

[N] NARRATIVE STORYLINE

From a UCS standpoint, a narrative is provided through a historical perspective that addresses different dates that impacted changes in the region. Often, one issue that urban containment aims to combat is the depreciation of a sense of community that comes from sprawling induced environments. If communities are less compact and connected, the increased reliance on the vehicle may then diminish the possibility to have a connection with the local community. A sense of community should be emphasized by this plan, and there should be mention as to how UCS can support this identity reinforcement. The plan does this by expressing the need to "adopt policies, regulations, and incentives to preserve and rehabilitate significant historic structures and cultural resources that contribute to a community's authenticity of place and ability to attract tourism" (*Metro Vision*, 2017, 13). This statement is listed as an option available to local

organizations that can help in creating livable communities, which contributes in being a positive outcome from UCS. Although this is mentioned, there isn't necessarily an acknowledgement of what the unique identity entails.

SCORE

The score for the DRCOG Metro Vision Plan achieves a score of **24** out of 68 under the condensed Bunnell and Jepson Plan Evaluation Protocol. This plan was organized in a consistent manner, which helped to a degree in being visually compelling and inspiring. Also, the use of images and maps were used seldom with multiple instances in which maps could have strengthened the story. Although the regional containment strategies are done at a voluntary approach, a stronger emphasis could've still been given to the Mile High Compact. Furthermore, this plan is short in comparison to the other two. Nonetheless, multiple strategies and methods of incentivization have been outlined which makes it reasonable to believe that growth management will only get better in the region.

BRIEF IMPLICATIONS FOR THE AUSTIN REGION

The state has no legislation requiring the implementation of UCS, but the region as a whole determined that such management would be in their best interest. The bottom-up approach the region underwent in order to achieve growth management is applicable to the Austin area since Texas has no policy for urban containment.

The lack of explanation for the multiple scenarios this plan utilized, such as growth management in lieu of UCS, don't necessarily hurt the region's outcome. However, as aforementioned, an elaboration as to how different scenarios can result in different outcomes for the region's growth management could benefit the reader by providing them with a personal, real-

world example that can strengthen their understanding of UCS and its several benefits. The application for Austin isn't to strive to achieve DRCOGs preferred scenario, but rather to understand how a presentation of multiple scenarios could benefit the reader and the plan as a whole. . While each region is different, and factors influencing some scenarios may not be applicable for others, there is still a sense of guidance that could be of assistance to the Austin region.

Seattle

In the Seattle region, UCS is classified as Urban Growth Areas, but the UCS will be utilized for consistency purposes. Within this UCS, "cities may not annex lands outside of an urban growth area, nor may they formally identify additions to the urban growth area independently of the county designation process" (*Vision 2040*, 2009, G-11). Furthermore, development outside of the UCS is meant to be rural. The UCS approach is certainly different than Denvers, making the parallel aspects differ greater from Austin, but how and for what purposes the strategies behind UCS are remain helpful.

In the state of Washington, specifically for counties with a population of 50,000 or more, it is mandatory to establish the designation of urban growth areas to prevent sprawling patterns and the vast amount of adverse effects from this uncontrolled growth. Given this form of UCS planning, the Puget Sound Regional Council has developed their urban growth area through a top-bottom approach, which is contrary to DRCOG. Nelson, Dawkins, and Sanchez have explained that regions with the existence statewide growth management programs have been proven to strengthen the UCS. Taking this into account, Puget Sound's Vision 2040 is expected to perform better than DRCOG's Metro Vision in the context of UCS.

[R] INSPIRATION AND ENGAGEMENT

From the beginning, Vision 2040 depicts an inspiring atmosphere that the audience would expect to encounter upon reading the plan. This atmosphere is largely represented through its vision statement, but it is worth mentioning that the 85-word vision statement doesn't include the words growth management. Such a concept certainly reflects the need for UCS in the region, so through the omission of these words it becomes apparent that the reason as to why planners created a relatively lengthy **vision statement** was so the readers could understand the definition rather than be left to interpret the overarching terms.

> "Our vision for the future advances the ideals of our people, our prosperity, and our planet. As we work toward achieving the region's vision, we must protect the environment, support and create vibrant, livable, and healthy communities, offer economic opportunities for all, provide safe and efficient mobility, and use our resources wisely and efficiently. Land use, economic, and transportation decisions will be integrated in a manner that supports a healthy environment, addresses global climate change, achieves social equity, and is attentive to the needs of future generations."
> Vision Statement (*Vision 2040*, 2009, xi)

Highlighted in green are the words that emphasize a recipe for complete sustainability. There is no mention of UCS, managing development, or combatting urban sprawl, yet the keywords in the vision statement point out what is needed in ultimately achieving the goals of UCS. The DRCOG vision statement was to the point, but Puget Sounds detailed vision statement benefits the reader since they can further understand the a need for a visionary plan that aligns with the goals of UCS.

The introductory section, following the vision statement, is put into terms that help the reader understand what the future could be for the Puget Sound Region. The compelling vision is supported not only through maps, but through the description of growth trends that precede the region's current state and project their expected direction. "The regions' geography has caused the central Puget Sound region to expand north along the Sound and south toward Olympia and

beyond" (*Vision 2040*, 2009, 2). Regional residents are aware of the scale that the plan identifies; the distance between Central Puget Sound and Olympia is 60 miles. For the purposes of this report, 60 miles is 10 miles less than the distance between San Marcos and Georgetown, which encompass the northern and southern points of the Austin Metropolitan area. Focusing on Puget Sound, these lengthy two directions that the growth is expanding are complemented by the following paragraph that identifies the forecasted population of more than 5 million people by 2040. This combination of outwards growth and a rapidly increasing population certainly raises awareness for the reader.

To complement the aforementioned case on Puget Sound's rapid urbanization, **maps** depicting the growth of the regions urban footprint are provided. While this supports the narrative aspect of this grading system since they provide history, the maps place the concerns from sprawl into context. In 1940, the urban footprint is clearly underwhelming whereas the map for the year 2000's depiction presents an overwhelmingly urbanized region with few "open" spots in between. This presentation of maps at different points in time provides some real-world context that the reader may better understand; this is opposed to simple textual inclusion that DRCOG's Metro Vision provided. Under the assumption that the reader lives in the Seattle area, their area of residence could raise their awareness through the possibility that the urban footprint maps depict vacant land; this could help generate an understanding of why much of the plan is devoted to growth management.

Another section where the plan serves as an example of inspiration and engagement for the Puget Sound region comes from highlighting adverse effects of urban sprawl through an environmental context. "Studies show that [development patterns] associated with low-density [trends] result in roughly two and a half times the annual greenhouse gas emissions and two times the energy used per capita compared to higher density development patterns" (*Vision 2040*, 2009,

15). Similar to the identification of the concerns from the regions outward urban growth, this statement uses a form of negative reinforcement that could evoke a sense of inspiration or even alarm for the reader. Aforementioned measures such as a urban footprint changes are put into a better context since the reader understands how a lack of or weak growth management can result in unfavorable environmental effects, in this case.

Finally, the aspect of the plan, strongly in alignment with UCS strategies, is the growth strategy map. The map is at the same scale of the regional urban footprint maps, emphasizing the vision of this plan and growth management as a whole that largely encompasses redirecting growth to regional centers and developing such growth in a compact and connected manner. Several measures prior to the presentation of the growth concept map gave an overview of the harm that comes from weak growth management, so the visionary map can help in solidifying an understanding of how Puget Sound aims to manage its future population growth.

The instances prior to the regional growth strategy map were largely negative as they drew concern for the region, yet this concern should be turned into inspiration. Not to be left in dismay, this increased awareness is resolved through the assurance of what the plan sets out to accomplish. Rather than waiting for people to act at a time that may be too late, the problems are identified with solutions that can only be achieved with collaboration and cooperation. Finally, while other cases provided personal, real-world examples of how the reader can relate to the adverse effects of sprawl; the difference in this section is that the real-world examples turn into opportunities given that the reader can identify with one or several activity centers and realize their UCS induced benefits.

[U] RECOGNIZE UNCERTAINTY

Continuing on the benefits, both visual and thematic, of the regional growth strategy, it is admirable that the supported guidelines are not meant to be granule in the sense that development must be so specific that it doesn't leave room for uncertainty. Rather, there is recognition in uncertainty on the plan's emphasis of how the regional growth strategy guidelines should be interpreted.

The regional growth strategy is made up of five metropolitan cities (including Seattle), 14 core cities, 18 larger cities, and 46 smaller cities. The core and metropolitan cities contain the regional growth centers as they are expected to experience the majority of the region's urban growth. The status of the geographies provides a "framework for the distribution of the region's forecast growth for the year 2040" (*Vision 2040*, 2009, 16). Recognition of uncertainty comes from the scale at which these frameworks are directed. This means that the plan's guidelines don't get specific at the city level, which is good to address since it is never certain what future factors may influence the forecasts. The ultimate goal from this strategy is to achieve regional growth management, so the plan accepts it isn't necessary to focus on a specific street, for instance, but rather ensure that the outcomes are met. An issue with UCS, and planning as whole, comes from the fact that predictability becomes immensely difficult especially when goals are set further in time such as 2040. The Puget Vision Plan recognizes this issue and does its best to ensure predictability at larger scales.

[P] ALTERNATIVE COURSES OF ACTION AND THEIR DIFFERENT OUTCOMES

Unlike DRCOG Metro Vision, Puget Sound Vision 2040 provides an assurance of monitoring efforts in two ways: implementation monitoring and performance monitoring. The monitoring efforts for this plan aren't descriptive, and they don't provide an instance of a

potentially unexpected occurrence that would need significant focus. Instead, the plan outlines how monitoring will be undertaken in a transparent way that could easily be applied to the themes of the plan, including UCS. “Performance measures will help to provide a snapshot of environment, housing, economic, development, transportation, and public services conditions that are important for the region” (*Vision 2040*, 2009, 100). The measurement of performance will therefore lead the way for any monitoring needs and decisions. This concept is applicable for the regional growth centers in which development and growth in itself is meant to be redirected inwards rather than enduring a sprawling tendency. It has already been acknowledged that the plan recognizes uncertainty by providing strategic growth guidelines at larger scales, so the monitoring fits here by ensuring the big picture is met and not a specific street corner.

[N] NARRATIVE STORYLINE

The narrative aspect is key for the plan’s sense of inspiration and engagement; conversely, the latter aspect amplifies the former. For the sake of the audience who is meant to be inspired, the visuals and compelling text in regards to the region's future are strengthened through the presentation of storytelling.

In addition to textual evidence, Puget Sound Vision 2040 provides historical insight through an elaborate yet easy to understand depiction of visuals. Cases in which these visuals were closely related to the influence of UCS are in the plan’s focus on population projections and the region’s urban footprint. The first aspect, historic and forecast growth, ranges from the year 1960 to 2040. Within this data visual, the employment population is marked darker than the overall population which further depicts a historical perspective of the region’s population. This narrative is then strengthened through the four maps depicting the regions urban footprint for the years 1940, 1960, 1980, and 2000.

SCORE

Following the dissection of Puget Sound Vision 2040 in the context of UCS, a score of **50** out of 64 has been determined. This plan was visually compelling and provided multiple instances in which the urban history was accounted for. Even though population and employment projections took one scenario into account, it is worth noting that the performance measures for the regional growth concepts are not granular. Rather, they allow for flexibility within designated areas of growth which is important since the goal is to manage growth at the larger level.

BRIEF IMPLICATIONS FOR THE AUSTIN REGION

The Puget Sound Vision 2040 plan was structured better than DRCOG's Metro Vision, yet it is important to reiterate that the latter is based on voluntary efforts while the former is based on statewide policy. The mandated regional efforts in growth management gave a stronger sense of assurance for proposals outlined in the plan. The Seattle region, geographically and politically, are very different than the Austin region, yet lessons from the Puget Sound Vision 2040 are applicable to a regional plan (if Austin were to ever develop one). Furthermore, the growth concept map for Imagine Austin is very similar to Puget Sounds. In fact, it may be too similar since Austin's inclusion of regional centers are only within city limits.

Lexington

The final plan to undergo analyzation will be for the Lexington-Fayette County area in Kentucky. This region is unique in that it is significantly smaller than Puget Sound, DRCOG, and Austin. Additionally, Lexington "was the first locality in the United States to limit its future urban development to a core area within its larger city boundaries [in 1958]" (Wassmer, 2006, 26). Based on Nelson and Dawkins, the Lexington UCS was deemed as being weak accommodating in that it plans for future growth, but does not ensure other factors such as sufficient infrastructure or

affordable housing provisions in a "strong" manner. This weak status becomes apparent as some of the following sections elaborate as to why there is a polarized divide on the preferences for the regions UCS. How the plan and the UCS overall accommodates for the urban form, however, will be given focus and ultimately draw implications for the Austin region.

Imagine Lexington is to be considered the regional plan as it not only sets out a vision for the city of Lexington, but the entirety of Fayette County. While other plans have dedicated portions or thematic aspects of their plan for their respective UCS, Imagine Lexington serves to integrate it into its 6 themes. Imagine Lexington, like the other cities under evaluation, does well in integrating the UCS context into its six thematic sections. Of these, the final theme tackles the UCS directly with some supporting frameworks to manage its future.

[R] INSPIRATION/ENGAGEMENT

The vision statement provided by Imagine Lexington highlights on several overarching themes that could engage residents of many backgrounds and beliefs, but for the purposes of UCS, it is interesting to point out how the lengthy statement has many connections to this subject. Topics such as equitable development, environmental protection, and landscape preservation are blatantly highlighted, yet it is the mention of regionalism that assures us as to how these several topics may be better achieved through this larger-scale planning.

> "The 2018 Comprehensive Plan, Imagine Lexington, seeks to provide flexible yet focused planning guidance to ensure equitable development of our community's resources and infrastructure that enhances our quality of life, and fosters regional planning and economic development. This will be accomplished while protecting the environment, promoting successful, accessible neighborhoods, and preserving the unique Bluegrass landscape that has made Lexington-Fayette County the Horse Capital of the World." - Vision Statement (*Imagine Lexington*, 2018, para. 1)

This plan is amongst the lengthiest to be evaluated, but also the most creative, engaging, and visually appealing. For the UCS context, the **maps** of the plan highlight the exterior of the

boundary when the thematic purpose was meant to focus on those outside the UCS. Such is the case for the theme pertaining to the environmental context. By blocking out what is inside the UCS, the audience can easily shift their focus to the exterior areas. For instance, the PDR Land Conservation Map, deliberately omits any infrastructure, land use, or services within the UCS in efforts to focus on the exterior and why such rural uses are needed. Furthermore, Lexingtonians pride themselves in the horse lands outside of the city which helps in their need for inspiration since it is a personal connection for the need for rural life within close proximity to the core.

While the maps highlighting the UCS are frequent, the **text** behind the overarching picture is also important. For the UCS perspective, the plan acknowledges that "many cities do not have the same environmental and natural constraints as Lexington, and feel more empowered to continue the onward march of suburban expansion" (*Imagine Lexington*, 2018, 152). Having already focused, upon several themes through the use of visuals, on the need for rural preservation, the plan emphasizes that its environmental and natural constraints serve as an opportunity and should generate pride within the local.

[U] RECOGNIZE UNCERTAINTY

In terms of forecasts for **population** and economic growth, the plan only presents one forecasted trend in that it anticipates a population of just under 400,000 by the year 2035 (*Imagine Lexington*, 2018, 6). This projection will be less controversial if the UCS boundaries are stated to lacking modification in the future. This is not the case as the following sections will further address why the UCS has been viewed as controversial within the region. Given the steps the plan has outlined to factor into decision making in the re-evaluation of the UCS, there should be alternative population and job growth projections to account for the different UCS related scenarios.

The following will focus on the controversial viewpoints of the Lexington UCS and the uncertainty recognized by the plan in implementing an accountability policy to further strengthen the vision for the future. There is recognition of uncertainty due to the polarized viewpoints, and there are also courses of action taken to remedy these issues and attempt to unite the region. Essentially, local officials, developers, and residents have polarized viewpoints on the policy. Six accountability policies have been created by the plan, but the first deals directly with the future of UCS. Within this section, the plan states that "there is uncertainty on all sides of the issue, and therefore a heightened sense of anxiety and concern" (*Imagine Lexington*, 2018, 210). This recognition is important, as plan makers emphasize the need to amend the future of the UCS so both sides could relish in the overarching benefits.

[P] Alternative Courses of Action and their Different Outcomes

To reinforce the plans method of determining its course of action in the context of UCS, the plans response to the **controversial UCS** will be examined. The plan addresses the controversial background of the regions UCS in the sense that many favor its recodification while others favor strict boundaries for the preservation of rich soils, farmland, and historic-related attributes outside of the UCS. There is realization that the UCS has kept the city compact, meeting the goal of limiting sprawling patterns, yet it is concluded that for the long-term, this method lacks sustainability and efficiency. "A true long-range plan and process is required to ensure future smart growth patterns, efficient infrastructure use, and the preservation of farmland" (*Imagine Lexington*, 2018, 207). Evidently, there is a need to reshape the policy behind the UCS.

Taking the preceding rationale into account, the plan communicates that future outcomes will continue to be shaped through an "**increased accessibility of information**" (*Imagine Lexington*, 2018, 207). Such information includes development and growth plans, opportunities for

public input, and other information of interest to local residents, developers, and officials. While this strategy isn't an alternative course of action, per se, the similarity to this Bunnell and Jepson category is that the plan advises the reader that their decisions will be better shaped through this increased access of information and participation to determine an optimal course of action. In stronger alignment with the purpose of Bunnell and Jepson's 3rd category, the plan has devised six accountability policies to secure an optimal and efficient decision behind significant projects or services such as the UCS. Accountability policy 1 deals solely with determining an outcome to the UCS issue that was previously mentioned. At its current state, no solution has been outlined, nonetheless the plan does well in communicating how future outcomes shall be shaped for UCS related decisions.

[N] NARRATIVE STORYLINE

This plan has already been evaluated for doing well in being inspirational and engaging for the audience; this is only strengthened through the plans strong narrative. Maps, among other visuals, are frequent and the text supporting it creates a stronger narrative. It isn't just a compilation of goals and strategies, but strong reasoning that can resonate with the reader and ultimately make it easier to read.

Referring back to the inspiration and engagement evaluation section for Lexington-Fayette, the plan had multiple instances where provided maps either omitted the uses within the exterior or interior of the UCS. This serves as beneficial, not only since it draws the audience's attention where the section of the plan favors, but since it also helps in establishing a clearer story. Such is the case in the **history of Lexington's Urban Service Boundary**. Since its creation in 1958, the boundary appears to have been modified seven times in that sections were expanded and lessened. Taking the twofold processes into consideration, the plan ensure that the story is told effectively through

coloring the expanded portions of the map in green. Conversely, the portions of the UCS that were removed are colored in red. Furthermore, the nine total maps depict the year a change happened. While all this should be enough to understand the historic modifications to Lexington's UCS, additional text is supplemented to ensure a complete understanding.

In addition to the historic aspect of the UCS, the plan integrates **cultural values** into the narrative. The agricultural aspect of the region, largely coming from the rural region outside of the UCS, has been highlighted as contributing not only to the economy, but to their sense of life. Furthermore, the preservation of its rural landscape has lead the plan to inform the reader of the result of the UCS has become "the preservation of Lexington's Bluegrass identity as the Horse Capital of the World"(*Imagine Lexington*, 2018, viii). While this serves in inspiring and engaging the audience to act now in whichever way they can, it also adds on to the narrative as this cultural context is integrated within a history of the decisions behind Lexington's UCS.

SCORE

Taking the evaluation of Imagine Lexington into great account, the reduced Bunnell and Jepson protocol in the context of UCS has resulted in this plan receiving the score of **56** out of 64 maximum achievable points. Aside from the fact that this plan was visually compelling and its use of maps, charts, and graphs strengthened the story, this plan excelled in the fact that there was ample recognition on the issues behind UCS in this region. There is a polarized perception for the Lexington-Fayette UCS, and to be more compelling, the plan did well in addressing both viewpoints and providing potential solution to bridge the gap. Similar to the other plans, however, there wasn't an explicit mention on multiple population forecasts and the different scenarios that could impact such projections.

BRIEF IMPLICATIONS FOR THE AUSTIN REGION

The Lexington-Fayette UCS, otherwise known as the Urban Service Boundary, provides lessons transferable to Austin as the region could also adopt the urban service containment style of UCS. Puget Sound was visually stunning and Imagine Lexington is no exception, but what the latter did is go into an in depth explanation in regards to the polarized backgrounds for their UCS. If the Austin region were to ever adopt regional based UCS, there will certainly be opposition. Austin could inspire regional residents through a depiction of policy that could benefit both accounts. Imagine Lexington also did the best out of the three plans in reinforcing their proud culture. Lexingtonians pride themselves for their horse-related culture. A future regional plan for Austin should reemphasize just how important the natural beauty is to the area. While this may not be applicable to the east, it could result in more opposition in regards to development in the western hills.

Conclusion

Together, the three brief implications serve as the conclusion for this chapter. A future Austin regional plan should appeal at a visual and textual context. Even if the regional coalition is voluntary based, like Denver's, the three plan evaluations emphasize the importance in appealing to the reader and have them understand why UCS is needed and the several consequences that come from uncontrolled sprawl. A strong method of inspiration and engagement for the reader that was prominent in Puget Sound and Lexington-Fayette, but weak in DRCOG, was the presentation of real-world examples that could resonate stronger with the reader and heighten their awareness for UCS. For DRCOG, Metro Vision mentioned that multiple scenarios were developed in order to determine recommended land use and transportation policies. Under the assumption that the reader knows how land use and transportation tie into UCS, the plan should've have explained how other

scenarios could've resulted in different outcomes. Space and tedious wording is also important to avoid in a plan, yet the scenario elaborations could've been included in the currently brief appendix. Also, the use of images presenting the different methods of development (i.e. compact, suburban, and rural) could've been provided with text describing the differences in the visuals and their unintended consequences that can be amended through UCS. If Austin were to adopt a regional comprehensive plan, UCS must be given focus and a personal, real-world appeal should be provided for the reader.

CHAPTER 6: LESSONS FOR THE AUSTIN AREA

Introduction

This chapter focuses on the implications for the Austin region if it ever aims to adopt UCS. The lessons learned will be an agglomeration of the previous sections which includes multiple case studies, regional plan evaluations, existing literature, and census data. It isn't to say that CAPCOG or another regional entity should abide by these suggestions, but the combination of references implies that these lessons may certainly aid in achieving a regional based UCS.

U.K. Greenbelt

The U.K. green belt policy is generally received on a positive note, yet it does come with some limitations worth recognizing. Considering that the London green belt is commonly taught in fundamental planning and urban design courses as an exemplary example in containment, it must be reiterated that the green belt policy has "affected the physical containment of the city, but not the functional containment" (Sturzaker & Mell, 2018, 70). Throughout history, the literature and case studies taught us that a concept known as the leapfrogging came into existence. Through this idea, predominantly residential development had no choice but to leap over the physical green belt and locate in satellite regions. Most notable for the smaller areas, satellite developments lacked public transportation or even a sense of identity. Given that such developments didn't contain an economic base, the job-housing balance appeared to experience an imbalance. The result was an increase in commuting distances, affected those that were too poor to reside within the inner core. Fortunately, many satellite areas are supported by public transit such as rail, but not all.

Solutions have been provided as the green belt policy appears difficult to remedy. The National Infrastructure Commission's proposal, specifically for the north Oxford area, has developed a plan to restructure the satellite town of Kidlington and reappraise the surrounding

greenbelt to strengthen it. In terms of the restructuration, a central corridor was incorporated that would host the towns current activity and also make a direct connection with public transit. Certainly, there is a strength in that this area is already served by public transit, but it becomes helpful to structure these potentially forgotten communities in a way that maximizes use of public space by concentrating activities. Such concepts were also apparent in the Houston-Galveston Area Council Livable Centers.

In reference to the U.K. and its green belt policy, Austin should recognize that issues were largely a contribution of a lack of regional coordination. It is reasonable to believe that issues, such as those with Liverpool and some satellite communities, would've been less severe through regional planning. It is important to consider the voice of even the smallest community to achieve sustainability.

Regional Plan Evaluations

Based on the review of the regional plans for Denver, Seattle, and Lexington (KY), several takeaways become applicable for the Austin Area. Through an analyses of the four primary themes Bunnell and Jepson present within its Plan Evaluation Protocol, it becomes apparent that plans must inspire and engage, recognize uncertainty, account for alternative courses of action and their different outcomes, and generate a narrative storyline (Bunnell & Jepson, 2011, 344).

To start, the Austin area is in great need of engaging and inspiring the local population. This inspiration and engagement could be better strengthened if a future regional plan incorporated inspiring text and visually appealing maps, charts, graphs, and images. A large factor contributing to DRCOG's low score came from the lack of visualization. Within the context of UCS, there were multiple accounts where text implied the need to strengthen regional growth management. For instance, there was recognition of the increasing urban footprint over time. This picture could've

had a stronger impression on the reader if maps supporting the text were provided. The plans for Puget Sound and Lexington-Fayette visually depicted changes in the urban footprint overtime and earned a greater score than the DRCOG plan.

Although DRCOG has a voluntary approach to containment under the Mile High Compact, the visual appeal to the plan should not be affected. On the contrary, the plan should make a greater effort in inspiring and engaging given the relatively weak UCS-based status of the region. If the Austin region were to ever reignite Envision Central Texas, there must be assurance that the complementary plan will excel in visual and even textual appeal.

The third theme within the protocol was the presentation of alternative courses of action and their different outcomes. This aspect of plan making is important as it is able to adapt to other situations. It is because of the preceding statement, that scenario building is imperative and strengthens the plan and its potential constraints in the future. "Scenario building is valuable because it challenges citizens and local officials to envision possible futures that are different from the past and the present" (Avin, 2007). In the case of Lexington-Fayette, there were major discrepancies over the existing UCS. A large portion of the population was against it, and the others were in favor. It is admirable that the plan provided the rationale behind both viewpoints, and devised policy and implementation guidelines The plan not only provided policy and implementation guidelines to strengthen the UCS at the long-term, but provided the reasoning for both perspectives in order for the reader to

Houston and Dallas Based Council of Governments

Navigating our way from the United Kingdom-to U.S. cities outside of Texas-to the state's two largest metropolitan areas, the North Texas Council of Governments and the Houston-

Galveston Area Council of Governments are also able to imply lessons for the Austin region. It goes to show that one doesn't have to look far to see similar issues of sprawl.

The Austin area is able to glean inspiration from NCTCOG and their implementation of TOD as a method of growth management. Many of the DART light-rail stations (i.e. Mockingbird) are seen as exemplary TOD sites where mixed-use development became prosperous, areas became walkable, and a certain proportion of units became designated as affordable. In short, TODs appear to alleviated sprawling issues considering that they combat many of their consequences. Many of these issues were recognized in Imagine Austin as well.

There must be mention as to the Austin regions weak passenger rail system in that it only hosts one commuter rail line that fails to run through many of the areas busiest centers. Also, there are many portions of the rail that is only one track. It is certainly easier for NCTCOG to boast their success in TOD since the rail already exists, however studies have shown that rail transit is not always fundamental in the fruition of TOD.

If the goal of TODs are to create dense, mixed-use developments that promote activities while boasting walkability and open space, then the Houston-Galveston Area Council of Governments have done well by not letting their extensive lack of passenger rail dissuade them from generating the same outcomes. Through H-GACs concept of livable centers, the same frameworks are able to be applied; this is also applicable for the different landscapes found in the massive metropolis. The Austin region certainly hosts the similar urban, suburban, and regional landscapes, so the livable centers can inspire those suburbs that Imagine Austin may not cover.

The Austin region can also take away the short-term projects devised by H-GACs livable centers. As a method of aimed at incentivizing, livable centers devised short-term projects that could inspire local neighborhood and decision makers to understand the benefits through a real

world example. It is important to mention that Nelson, Dawkins, and Sanchez stated that a large reason for exurban development was the anti-urban attitudes. In Texas, urbanization can easily be perceived with a negative connotation given that commutes are increasingly lengthy, land is unaffordable, and other reasons that may be a result of uncoordinated regional planning. If local residents are able to see that such projects aren't only a method of generating revenue, but actually consider the public's well-being then attitudes may change. Through H-GAC's temporary better blocks, anti-urbanists may be able to realize some of the benefits of urbanization. Furthermore, the low-cost advantages can lead to long-term decisions from local officials. There may be some resistance since many Texans are reliant on their vehicles, but if more livable centers and TODs start appearing, then perceptions may certainly be skewed.

Additional Lessons from Literature

Some of the lessons provided by literature were made clear through the case studies, their unforeseen consequences, and pertinent solutions. This is the apparent in the relationship between Peter Hall's publication and the Liverpool and Northern Oxford cases. Also, Nelson, Dawkins, and Sanchez emphasized that exurban development is the least efficient since the low-densities aren't able to support public transportation and resources also experience costly distribution. All of the aforementioned issues are recognized by Imagine Austin and their section on weak regionalism, yet it becomes essential to consider changing technologies for the future.

Acknowledged by Nelson, Dawkins, Sanchez and other references is the fact that technological innovations will likely play a key role in the development of future strategies pertinent to the fight against urban sprawl. Through future innovations in technology, heavy reliance on gas-based automobiles are expected to halt. "As oil production is expected to peak within a decade and then gradually decline, energy prices are expected to continue their upward

trend, triggering the most important technological transition in transportation since the automobile" (Rodrigue, 2013, 78-79). It is therefore important to add that a key consequence of urban sprawl is increased reliance on SOV which damages air qualities all around. This is one of the reasons to strive for regionalism since future occurrences (i.e. changes in transportation) will become inevitable. This report recommends that Austin strive for a regional-scale method of UCS, and changes in the future will be easier to combat if the multiple localities unite.

Conclusion

It was largely beneficial to garner a variety of references in order to present lessons for the Austin region. Green belts in the U.K., which have a notion of being successful, have their own issues as well. It goes to show that regional coordination is of the utmost importance if the Austin area is to achieve the positive effects of UCS. Without such coordination, plans such as Imagine Austin will continue to struggle. Fortunately, the Houston and Dallas area COGs provided lessons in which growth management and inspiration to the public can be strengthened.

CHAPTER 7: CONCLUSION

The lessons applicable for the Austin region were largely given focus in the preceding Chapter, so this conclusion aims to ensure that the future of the Austin area and growth management isn't all that bleak. It has been proven that regional collaboration is highly needed to ensure that the benefits from UCS are achieved. Although an argument can be made in regards to the fact that many of these recommendations for the Austin area have already been acknowledged through the need for regionalism in the Imagine Austin Plan, the preceding reviews on the many references can strengthen the plans recognition. In essence, it seems certain that regional collaboration is needed now more than ever since the sprawling induced issues have been apparent in many parts of the urbanized world. If anything, this report has strengthened Austin's need for UCS at a regional scale.

CAPCOG needs to revive Envision Central Texas and reignite the regional-based ideas. It is with high hopes that a revamped ECT doesn't dissolve this time around, but if it does, then it should do all it can to inspire and engage locals to act. The population of the Austin area is much greater than it was more than 10 years ago, so ECT certainly has many to educate that may have never been aware of its existence in the first place.

At this rate, the Austin area will continue to grow and the pertinent consequences can only worsen. Fortunately, future technologies may play a key role in the alleviation of many drawbacks from urban sprawl. One can only hope that these technologies present themselves before it is too late.

APPENDIX

Plan Evaluation Protocol at the UCS Context

Inspiration and Engagement **[R]**

1. Is the UCS aspect of the plan imaginative and creative (extent of commitment to preparing a meaningful, effective plan)?
2. Does the UCS aspect of the plan put forward a compelling vision (through illustrations, photographs, maps, and words) of what the future could be like?
3. Is there a vision statement that conveys the essence of what the community wants to be and look like in the future in alignment with the goals of UCS?

Recognize Uncertainty **[U]**

1. Does the plan present more than one forecast of the future population and/or job growth, and in so doing recognize uncertainty; are their population forecast that recognize what the region could look like with a lack of UCS and recognize the uncertainty of UCS?
2. Does the plan present alternative scenarios, or at the very least compare the Desired Scenario vs. Trend Scenario for UCS relevance?
3. "Does the plan provide clear explanations of alternative courses of action that enhance community flexibility and adaptation in dealing with complex situations?" (Berke et al., 2006)

Alternative Courses of Action and their Different Outcomes **[P]**

1. Does the plan communicate how future outcomes are likely to be shaped by different policies, especially UCS, and courses of action?
2. Does the plan present compelling arguments for the recommended course of action, involving UCS?
3. Are rationales for the recommended course of action effectively presented? (Baer 1997)
4. Does the plan convey an understanding of the consequences of different courses of action?

Narrative Storyline **[N]**

1. Does the plan provide historical perspective through extensive narrative of its history and how it has changed over time; is there a history of UCS in the region?
2. Does the plan reinforce the community's unique identity and sense of place by conveying an understanding of its unique geography, history, economy, political culture, etc. in alignment with the importance of UCS?
3. Is the plan more than a collection of separate plan elements (what I call the "check-box" approach to plan making)? Does it contain a unifying narrative storyline that tells an engaging story?

Miscellaneous

1. Does the plan include an attractive, highly readable, and informative executive summary?
2. Does the plan exhort and inspire people to act?

3. Are maps included in the plan *clear, relevant and comprehensible?* (Berke et al., 2006)

Key: No (0 points), Somewhat (2 points), Yes (4 points)

DRCOG Scorecard

Inspiration and Engagement **[R]**

1. Is the UCS aspect of the plan imaginative and creative (extent of commitment to preparing a meaningful, effective plan)? **2**
2. Does the UCS aspect of the plan put forward a compelling vision (through illustrations, photographs, maps, and words) of what the future could be like? **2**
3. Is there a vision statement that conveys the essence of what the community wants to be and look like in the future in alignment with the goals of UCS? **2**

Recognize Uncertainty **[U]**

1. Does the plan present more than one forecast of the future population and/or job growth, and in so doing recognize uncertainty; are their population forecast that recognize what the region could look like with a lack of UCS and recognize the uncertainty of UCS? **0**
2. Does the plan present alternative scenarios, or at the very least compare the Desired Scenario vs. Trend Scenario for UCS relevance? **0**
3. "Does the plan provide clear explanations of alternative courses of action that enhance community flexibility and adaptation in dealing with complex situations?" (Berke et al., 2006) **0**

Alternative Courses of Action and their Different Outcomes **[P]**

1. Does the plan communicate how future outcomes are likely to be shaped by different policies, especially UCS, and courses of action? **2**
2. Does the plan present compelling arguments for the recommended course of action, involving UCS? **2**
3. Are rationales for the recommended course of action effectively presented? (Baer 1997) **2**
4. Does the plan convey an understanding of the consequences of different courses of action? **0**

Narrative Storyline **[N]**

1. Does the plan provide historical perspective through extensive narrative of its history and how it has changed over time; is there a history of UCS in the region? **2**
2. Does the plan reinforce the community's unique identity and sense of place by conveying an understanding of its unique geography, history, economy, political culture, etc. in alignment with the importance of UCS? **2**

3. Is the plan more than a collection of separate plan elements (what I call the "check-box" approach to plan making)? Does it contain a unifying narrative storyline that tells an engaging story? **2**

Miscellaneous

1. Does the plan include an attractive, highly readable, and informative executive summary? **2**
2. Does the plan exhort and inspire people to act? **2**
3. Are maps included in the plan *clear, relevant and comprehensible?* (Berke et al., 2006) **2**

Puget Sound Scorecard

Inspiration and Engagement **[R]**

1. Is the UCS aspect of the plan imaginative and creative (extent of commitment to preparing a meaningful, effective plan)? **4**
2. Does the UCS aspect of the plan put forward a compelling vision (through illustrations, photographs, maps, and words) of what the future could be like? **4**
3. Is there a vision statement that conveys the essence of what the community wants to be and look like in the future in alignment with the goals of UCS? **4**

Recognize Uncertainty **[U]**

1. Does the plan present more than one forecast of the future population and/or job growth, and in so doing recognize uncertainty; are their population forecast that recognize what the region could look like with a lack of UCS and recognize the uncertainty of UCS? **2**
2. Does the plan present alternative scenarios, or at the very least compare the Desired Scenario vs. Trend Scenario for UCS relevance? **2**
3. "Does the plan provide clear explanations of alternative courses of action that enhance community flexibility and adaptation in dealing with complex situations?" (Berke et al., 2006) **2**

Alternative Courses of Action and their Different Outcomes **[P]**

1. Does the plan communicate how future outcomes are likely to be shaped by different policies, especially UCS, and courses of action? **2**
2. Does the plan present compelling arguments for the recommended course of action, involving UCS? **2**
3. Are rationales for the recommended course of action effectively presented? (Baer 1997) **2**
4. Does the plan convey an understanding of the consequences of different courses of action? **2**

Narrative Storyline **[N]**

1. Does the plan provide historical perspective through extensive narrative of its history and how it has changed over time; is there a history of UCS in the region? **4**

2. Does the plan reinforce the community's unique identity and sense of place by conveying an understanding of its unique geography, history, economy, political culture, etc. in alignment with the importance of UCS? **2**
3. Is the plan more than a collection of separate plan elements (what I call the "check-box" approach to plan making)? Does it contain a unifying narrative storyline that tells an engaging story? **4**

Miscellaneous

1. Does the plan include an attractive, highly readable, and informative executive summary? **4**
2. Does the plan exhort and inspire people to act? **4**
3. Are maps included in the plan *clear, relevant and comprehensible?* (Berke et al., 2006) **4**

Lexington-Fayette Scorecard

Inspiration and Engagement **[R]**

1. Is the UCS aspect of the plan imaginative and creative (extent of commitment to preparing a meaningful, effective plan)? **4**
2. Does the UCS aspect of the plan put forward a compelling vision (through illustrations, photographs, maps, and words) of what the future could be like? **4**
3. Is there a vision statement that conveys the essence of what the community wants to be and look like in the future in alignment with the goals of UCS? **4**

Recognize Uncertainty **[U]**

1. Does the plan present more than one forecast of the future population and/or job growth, and in so doing recognize uncertainty; are their population forecast that recognize what the region could look like with a lack of UCS and recognize the uncertainty of UCS? **2**
2. Does the plan present alternative scenarios, or at the very least compare the Desired Scenario vs. Trend Scenario for UCS relevance? **2**
3. "Does the plan provide clear explanations of alternative courses of action that enhance community flexibility and adaptation in dealing with complex situations?" (Berke et al., 2006) **4**

Alternative Courses of Action and their Different Outcomes **[P]**

1. Does the plan communicate how future outcomes are likely to be shaped by different policies, especially UCS, and courses of action? **2**
2. Does the plan present compelling arguments for the recommended course of action, involving UCS? **2**
3. Are rationales for the recommended course of action effectively presented? (Baer 1997) **2**
4. Does the plan convey an understanding of the consequences of different courses of action? **2**

Narrative Storyline **[N]**

1. Does the plan provide historical perspective through extensive narrative of its history and how it has changed over time; is there a history of UCS in the region? **4**
2. Does the plan reinforce the community's unique identity and sense of place by conveying an understanding of its unique geography, history, economy, political culture, etc. in alignment with the importance of UCS? **4**
3. Is the plan more than a collection of separate plan elements (what I call the "check-box" approach to plan making)? Does it contain a unifying narrative storyline that tells an engaging story? **4**

Miscellaneous

1. Does the plan include an attractive, highly readable, and informative executive summary? **4**
2. Does the plan exhort and inspire people to act? **4**
3. Are maps included in the plan *clear, relevant and comprehensible?* (Berke et al., 2006) **4**

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